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Community Engagement in Open-Air Museums for Documenting Vernacular Architecture:

A Comparative Case Study of Bokrijk and Makumbusho

***Rweyemamu Valentine Vedasto, Koenraad Van Cleempoel, Els Hannes, Shubira Leonidas Kalugila and Sarah Phoya**
https://orcid.org/0009-0005-1723-8650

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Abstract

This paper explores how open-air museums use community engagement to preserve and transmit knowledge of vernacular architecture, and how these practices can inform architectural education. Drawing on qualitative data from two case studies, Bokrijk Open-Air Museum (Belgium) and Makumbusho Village Museum (Tanzania), the study compares institutional strategies for involving local communities, documenting building traditions, and supporting heritage-based learning. The findings reveal contrasting approaches. Bokrijk emphasises research-driven restoration, supported by government funding, where conservation is visible to the public and serves as a "living lab" for students and visitors. In contrast, Makumbusho emphasises grassroots co-creation, involving elders, artisans, and community members in maintaining traditional houses with indigenous techniques. Despite structural differences, both museums prioritise community knowledge, cultural relevance, and hands-on learning. The study demonstrates that open-air museums can bridge vernacular heritage and architectural pedagogy, offering lessons for sustainability, contextual design, and climate-resilient construction.

Keywords: Bokrijk, climate resilience, community engagement, comparative study, heritage preservation, makumbusho, open-air museums, vernacular architecture

INTRODUCTION

Vernacular architecture is increasingly under threat from urbanisation, climate change, and the erosion of generational knowledge (Aktürk & Fluck, 2022; Inam, 2025; Pardo, 2023). While global heritage institutions have advocated for its protection, the everyday mechanisms through which such knowledge is preserved and transmitted remain underexplored in architectural education, particularly in sub-Saharan Africa (Oliver, 2006).

Open-air museums provide one response to this challenge. They preserve both tangible and intangible heritage and depend on meaningful community participation for their authenticity and sustainability (Clarke, 2013). In recent years, community engagement has become central to heritage conservation, reinforcing international frameworks such as the 2003 United Nations Educational, Scientific and Cultural Organisation (UNESCO) Convention on Intangible Cultural Heritage, which recognises communities as vital stewards of cultural heritage.

In architectural education, however, colonial legacies continue to marginalise indigenous knowledge systems and community-based conservation practices (Berlanda, 2017). To address this gap, this paper examines two open-air museums in contrasting contexts; Bokrijk in Belgium, a European and research-driven model, and Makumbusho in Tanzania, a grassroots and community-led initiative. Together, they highlight different ways in which museums mediate community engagement and vernacular knowledge transmission.

**Corresponding author:*
Rweyemamu Valentine Vedasto *PhD Student, Hasselt University, Belgium & Ardhi University, Tanzania*
Email: rweyemamu.vedasto@uhasselt.be

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This study pursues three objectives: first, to examine how community engagement operates in Makumbusho and Bokrijk in documenting vernacular architecture; second, to compare grassroots and research-driven approaches to open-air museums; and third, to analyse how lessons from these cases can inform heritage conservation and architectural education in Tanzania and, more broadly, East Africa.

THEORY

This literature review is organised into four thematic areas that collectively frame the study's conceptual foundation. It first examines the contemporary relevance of vernacular architecture, highlighting its environmental adaptability and cultural value. It then discusses community engagement in heritage preservation, emphasising participatory conservation and intergenerational knowledge transfer. The review also explores open-air museums as heritage laboratories that integrate tangible and intangible traditions through experiential learning. Finally, it considers implications for architectural education, particularly the need to embed vernacular knowledge and practice-based pedagogy within design curricula.

Vernacular Architecture and Its Contemporary Relevance

Vernacular architecture refers to building practices rooted in local geography, climate, cultural traditions, and materials. These structures are typically constructed by local communities without the involvement of formally trained professionals, drawing on traditional knowledge transmitted across generations (Pardo, 2023; Vellinga et al., 2024). Informed by environmental conditions and socio-economic realities, vernacular architecture reflects the cultural values and lived experiences of the communities that produce and inhabit it.

Beyond cultural and historical significance, vernacular buildings are widely recognised for their ecological value. They make efficient use of local, low-impact resources, are cost-effective, and minimise energy demand (Pardo, 2023). As Oliver (2006) observes, such architecture exemplifies context-specific design intelligence emerging from collective understandings of place, necessity, and innovation. Contemporary studies further emphasise its environmental responsiveness, particularly by employing bio-based, low-carbon materials such as adobe, rammed earth, thatch, and bamboo. These materials not only lower embodied carbon but also enable passive thermal regulation and climate adaptation (Hu, 2023).

Performance assessments show that vernacular buildings often surpass modern constructions in energy efficiency, with simulation studies indicating significantly lower annual energy demands (Wang et al., 2022). This body of research affirms vernacular architecture's continued relevance as a resilient, sustainable model for the built environment.

Despite these strengths, vernacular architecture remains undervalued in mainstream architectural practice and education. It is frequently dismissed as outdated or simplistic, a perception that diminishes its potential to inform contemporary, climate-responsive design (Inam, 2025; Yang et al., 2024). However, amid the intensifying global climate crisis, there is a growing shift among architects and educators toward traditional building knowledge as a low-tech, adaptive alternative to high-energy solutions.

Earlier architectural discourse often favoured technological innovation and globalised aesthetics, but recent thinking has re-engaged with the sustainable wisdom embedded in vernacular architecture. These systems employ passive cooling, thermal massing, and locally sourced materials strategies developed through centuries of adaptation to environmental constraints. As noted by UNESCO (2024), vernacular design promotes harmony with natural systems by relying on place-based practices rather than technologically complex solutions. Berlanda (2017) similarly argues that decolonising architectural education entails moving away from Eurocentric curricula and centering indigenous knowledge and spatial practices as foundational to design pedagogy.

While scholars broadly agree that vernacular systems embody context-responsive sustainability and low-carbon potential (Hu, 2023; Oliver, 2006), others caution against romanticising tradition without recognising variability in performance, maintenance burdens, or shifting community aspirations (Inam, 2025; Yang et al., 2024). This tension underscores the need for research that evaluates vernacular knowledge critically,

particularly within architectural education frameworks that frequently overlook its potential.

Community Engagement in Heritage Preservation

Influential international agreements have shaped a marked global shift toward community-centred heritage practice. UNESCO's 2003 Intangible Heritage Convention established a framework that recognises community knowledge and custodianship as central to safeguarding traditions, while the Council of Europe's Faro Convention (2005) reinforced this by framing heritage as a collective right and a resource for social participation. Together, these frameworks have encouraged governments and institutions to move beyond monument-focused approaches, emphasising instead community agency, participation, and shared governance in heritage management.

This transition is exemplified by participatory models such as inclusive community (iCommunity) and other commons-based approaches, which reflect international agreements that emphasise empowering local communities in heritage decision-making (Adell et al., 2015; Iaione et al., 2022; Nasrolahi et al., 2022). Scholars such as Smith (2006) and Waterton and Smith (2010) suggest that heritage should be understood not only as a physical entity but also as a social process formed through negotiation, memory, and everyday use. In this perspective, safeguarding vernacular architecture requires engaging the builders, users, and communities who attribute meaning to it.

Scholars from the Global South underline that sustaining vernacular heritage requires engaging local communities directly in processes of documentation, interpretation, and stewardship (Munjeri, 2004; Ndoro & Wijesuriya, 2015). In the African context, where oral tradition, ritual practice, and seasonal knowledge are integral to construction, the inclusion of local knowledge-holders is particularly critical. These culturally embedded practices shape vernacular building systems and demand conservation strategies that respect and engage local expertise. This has been increasingly recognised in heritage programs and open-air museum initiatives across the continent, which demonstrate that sustainable conservation requires the direct participation of community custodians in documentation, interpretation, and restoration (Joffroy, 2005).

There is a broad consensus that participation is essential, yet the literature diverges on depth and quality; whereas some studies evidence co-creation and shared authority, others document superficial involvement, power asymmetries, and capacity constraints that limit genuine community authorship (Ndoro & Wijesuriya, 2015; Waterton & Smith, 2010). The divergence between formalised and community-based approaches highlights a persistent gap; African models of stewardship remain underrepresented in architectural education despite their relevance for culturally grounded design.

Open-Air Museums as Heritage Laboratories

Open-air museums (OAMs) first appeared in Europe during the late nineteenth and early twentieth centuries, developed as creative initiatives to counter the rapid disappearance of tangible and intangible heritage caused by industrialisation, urban growth, and wider socio-economic change. Conceived as outdoor heritage spaces, OAMs are unique in their ability to preserve not only isolated artefacts or architectural fragments but also entire buildings, traditional construction techniques, and everyday lifeways, reconstructed and interpreted within recreated or representative cultural landscapes (Ali & Zawawi, 2010).

What sets open-air museums apart from conventional heritage institutions is their emphasis on experiential learning and engagement. These museums function as dynamic spaces where heritage is not simply displayed but performed, enacted, and taught. Visitors can witness live demonstrations of vernacular building techniques, interact with craftspeople, or participate in reenactments of traditional practices. In this sense, OAMs serve as "heritage laboratories" sites where the past is actively investigated, interpreted, and reconstituted through material culture and embodied knowledge (Smith, 2006).

Open-air museums also operate as interdisciplinary platforms. Their programming often brings together expertise from architecture, anthropology, conservation science, history, and education. This convergence allows OAMs to facilitate nuanced understandings of how built heritage is produced, maintained, and transmitted

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across generations. As such, they can play a vital role in safeguarding vernacular architecture, particularly in regions where modernisation and real estate pressures threaten the survival of traditional construction forms and cultural expressions.

In the context of architectural education, OAMs offer a pedagogical model grounded in practice-based learning. By making tangible the processes of heritage production through reconstruction, conservation, and storytelling, these institutions contribute to the development of critical competencies in aspiring architects. Students and professionals alike can observe the embodied logic of vernacular design; the climatically adapted forms, material economies, social configurations, and symbolic meanings embedded in traditional buildings. This exposure fosters not only technical understanding but also ethical sensitivity toward cultural continuity and community involvement in heritage conservation (Avrami et al., 2019).

Importantly, the conceptual model of OAMs as heritage laboratories aligns with broader discourses in critical heritage studies that challenge static and object-centred approaches to preservation. Instead, they advocate for participatory, evolving, and situated practices, where heritage is understood as a process, not just a product (Harrison, 2013; Waterton & Smith, 2010). Open-air museums exemplify this by integrating local knowledge systems, promoting intangible heritage such as oral traditions and rituals, and involving communities in both curation and construction.

European OAMs like Bokrijk are resource-rich and research-driven, while African ones like Makumbusho rely on grassroots participation, highlighting institutional contexts in shaping preservation and vernacular knowledge.

Implications for Architectural Education

Contemporary architectural education in many postcolonial contexts continues to be shaped by modernist paradigms that marginalise traditional building knowledge and locally grounded design practices. Despite significant societal and professional changes, architectural education largely retains outdated pedagogical models rooted in the Beaux-Arts and Bauhaus traditions, emphasising universal forms while neglecting the socio-cultural realities of local contexts and practices (Berlanda, 2017; Salama, 2015; Salama & Wilkinson, 2007). This reliance on imported design ideals has resulted in curricula that emphasise theoretical abstraction and modern technologies, while overlooking the adaptive intelligence embedded in vernacular construction systems that evolved in direct response to climate, material availability, and cultural patterns (Oliver, 2006). Consequently, many graduates are ill-prepared to engage meaningfully with indigenous construction knowledge or contribute to community-driven conservation practices, reflecting broader critiques that design education often neglects research-informed and contextually grounded approaches (Ndoro & Wijesuriya, 2015)

Scholars increasingly call for pedagogical reform, advocating for experiential, context-sensitive learning that integrates sustainability with vernacular knowledge. Salama (2015) emphasises a shift toward inquiry-based, collaborative approaches that connect studio practice with socio-cultural and environmental realities. In contrast, Asquith and Vellinga (2006) argue that engagement with vernacular traditions fosters a deeper understanding of indigenous techniques, ecological adaptation, and cultural resilience essential for contemporary practice. Participatory and field-based approaches such as site visits, community collaboration, and immersion in living traditions enable students to engage with heritage values while developing practical skills (Munjeri, 2004; Waterton & Smith, 2010).

Open-air museums are increasingly recognised as valuable educational resources, functioning as heritage laboratories where traditional building techniques and cultural practices are documented and performed for public learning. As Ali and Zawawi (2010) emphasise, these museums safeguard both the material dimensions of architecture and the associated intangible knowledge of craft, ritual, and ecological adaptation embedded in vernacular traditions. Integrating museum-based experiential learning into curricula responds to calls for decolonising education (Berlanda, 2017; Salama et al., 2025) and aligns with UNESCO's emphasis on safeguarding intangible cultural heritage through community participation. By bridging academic design education with traditional ecological knowledge and community engagement, architectural programs can prepare future architects to address

climate resilience, cultural continuity, and sustainable development (Munjeri, 2004; Ndoro & Wijesuriya, 2015)

Frameworks such as Leadership in Energy and Environmental Design (LEED) and the Building Research Establishment Environmental Assessment Method (BREEAM) embed Eurocentric assumptions that marginalize low-tech, bio-based practices central to vernacular systems. In Africa, passive design, craft knowledge, and local materials hold ecological value poorly captured by such universal ratings, reinforcing calls for decolonised, context-specific typologies (Salama et al., 2025). Scholarship converges on three points: vernacular traditions remain ecologically relevant, community participation is indispensable, and open-air museums provide vital pedagogical platforms. Divergences concern participation depth, risks of transplanting European models, and limited African-centered research. This article addresses that gap through a comparative analysis of Bokrijk and Makumbusho.

Conceptual Framework

Vernacular Knowledge Mediation Framework

Building on the four thematic strands identified in the literature review, this study proposes a conceptual framework that explains how vernacular knowledge is activated, mediated, and institutionalised through open-air museums. The framework conceptualises vernacular architecture as a foundational knowledge system embedded in local ecology, materials, cultural practices, and intergenerational memory. This knowledge, however, does not automatically translate into contemporary architectural practice; it requires activation through social processes.

Community engagement functions as the enabling mechanism that sustains and transmits vernacular knowledge. Through co-creation, shared stewardship, and intergenerational participation, communities safeguard both tangible structures and intangible construction practices. In this view, heritage is not merely a physical artefact but a socially negotiated and continuously reproduced process.

Open-air museums operate as mediating institutions within this system. By reconstructing buildings, facilitating live demonstrations, and documenting craft traditions, they translate embodied knowledge into structured experiential learning environments. As "heritage laboratories," they bridge informal community-based knowledge systems and formal architectural education.

The framework further posits that when vernacular knowledge is mediated through open-air museums, it influences architectural education by embedding practice-based pedagogy, climate-responsive design principles, and culturally grounded approaches within curricula. This process challenges Eurocentric design paradigms and promotes decolonised, context-sensitive architectural training.

Importantly, the relationship is cyclical rather than linear. Reformed architectural education produces graduates who can re-engage with communities, contribute to policy development, and strengthen vernacular systems. The framework therefore conceptualises vernacular heritage transmission as a dynamic feedback loop connecting communities, institutions, and educational systems. **Figure 1** presents the conceptual framework guiding this study, illustrating how vernacular architecture is mediated through community engagement and open-air museums to influence architectural education.

RESEARCH METHODS

This research takes a qualitative comparative case study approach, focusing on how open-air museums engage communities in documenting and transmitting vernacular architecture, and the implications for architectural education. Such an approach is valuable for investigating context-rich and complex situations, offering depth of understanding over generalizability (Creswell, 2007; Denzin & Lincoln, 2018; Patnaik & Pandey, 2019).

Two purposefully selected museums, Bokrijk in Belgium and Makumbusho in Tanzania, were chosen as information-rich cases offering contrasting yet complementary cultural contexts (Patton, 2010). The selection was also informed by the Institutional University Cooperation (IUC) partnership between Ardhi University and Hasselt University, which promotes joint heritage studies and education research. Bokrijk's selection is further reinforced by its exemplary role within

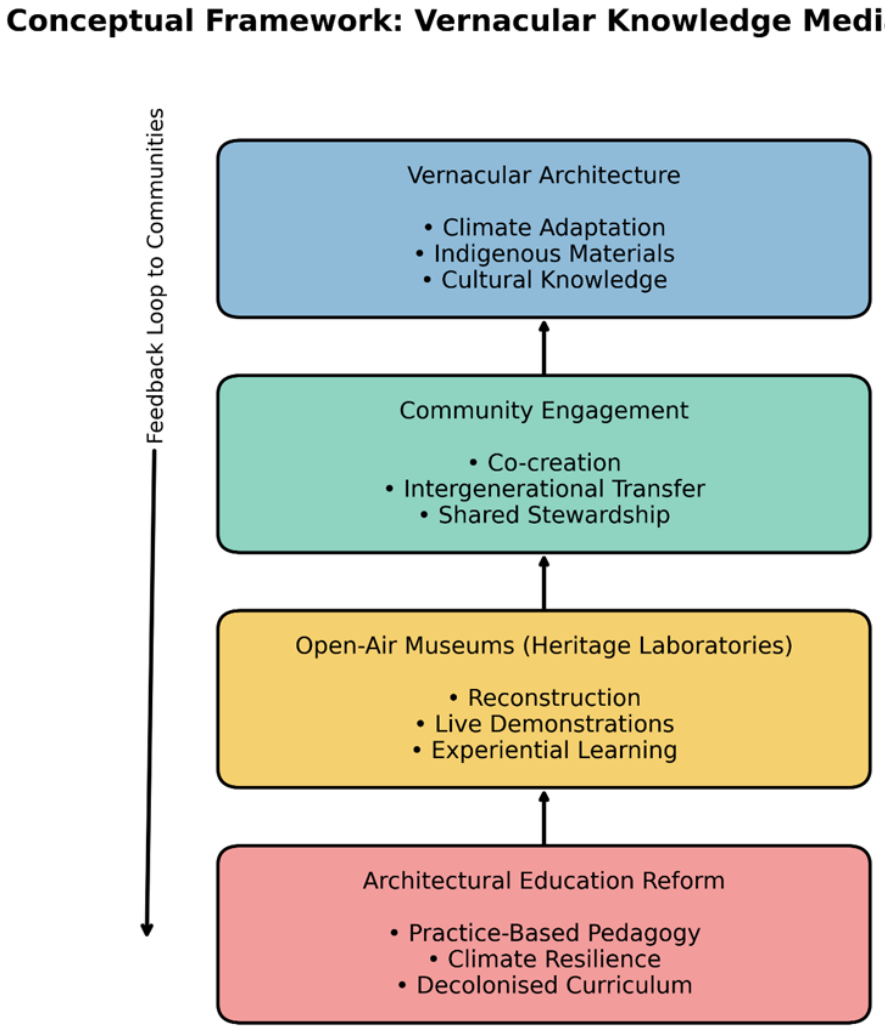

FIGURE 1
Vernacular knowledge mediation through open-air museums
Source: Author's conceptual framework based on literature synthesis, 2026

the European Open-Air Museums network, with its curator having served as president of the Association, positioning it as a model of European practice. Makumbusho, conversely, exemplifies a Tanzanian grassroots model where vernacular heritage is co-created with local communities. Together, they provide a robust cross-continental comparison.

Qualitative inquiry prioritises depth and meaning, enabling analysis of socially embedded knowledge systems that cannot be captured through quantitative approaches (Creswell, 2007; Denzin & Lincoln, 2018).

The study gathered material through semi-structured interviews and written submissions from curators and managerial staff. These participants were considered key informants, able to provide expert insights grounded in their institutional and heritage practice experience (Patnaik & Pandey, 2019). At Bokrijk, the chief curator was interviewed in person; at Makumbusho, two managers provided detailed written responses to structured, open-ended questions aligned with the same thematic focus. These interviews and responses constitute the primary data sources of the study, formally cited as personal communications. They provide first-hand institutional perspectives, treated with the same rigor as published sources through systematic coding and cross-case comparison. The decision to rely on institutional perspectives was deliberate; curators and managers were assumed to possess a comprehensive understanding of both strategic goals and operational practices. However,

this inevitably excludes the perspectives of artisans, students, or visitors, who might interpret museum engagement differently.

Analysis followed Braun and Clarke's (2006) six-step thematic framework: (1) familiarisation with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. This stepwise approach ensured systematic coding while remaining sensitive to cultural and contextual nuances. To enhance validity, data from both museums were coded independently before being compared across cases, and patterns were checked against the original transcripts and written responses for consistency.

Limitations were recognised at each stage. The small sample size and focus on institutional actors present a typical constraint in qualitative research (Denzin & Lincoln, 2018). Potential bias arises from the absence of artisans, students, and visitors, whose views would offer richer triangulation. The study, therefore, cannot claim comprehensiveness but instead offers an interpretive entry point into how open-air museums function as heritage custodians and educational platforms. Despite these boundaries, the two cases generate transferable insights, highlighting institutional logics that shape community engagement and knowledge transmission in diverse cultural settings.

RESULTS

This section presents the outcomes of two case studies; Bokrijk Open-Air Museum in Belgium and Makumbusho Village Museum in Tanzania. Curator and manager accounts illustrate how vernacular building knowledge is safeguarded and transmitted through restoration, community engagement, and education.

Bokrijk Open-Air Museum

The Bokrijk Open-Air Museum presents a robust and deeply integrated model for safeguarding vernacular architecture, combining historical authenticity, living craftsmanship, and broad community participation. According to the curator: "*Vernacular architecture really means that this type of building… originated because of the soil, the microclimate, the shrubs and the trees that are present.*" This ecological and landscape-based understanding is key to Bokrijk's conservation philosophy.

One of the museum's most distinctive strengths lies in its restoration philosophy. The curator highlighted: "*We keep the fences low so that the visitors can watch… protection is also about communication.*" All buildings, some dating back centuries, are restored by in-house teams using traditional materials and methods. Restoration is not hidden from the public but instead presented as part of the museum's educational offer. Between 2017 and 2024, the museum undertook the ambitious restoration of all 124 historic buildings, supported by €25 million in government funding. Yet the curator pointed out that maintenance remains a challenge, particularly because no one lives in these buildings, unlike in their original village settings. Another difficulty mentioned was sourcing suitable materials for renovation, since climate change has altered local crops, sometimes forcing materials to be obtained from distant regions

Another central theme is community engagement. As noted by the curator: "*We will welcome the community from Lille… they will be here with 160 people.*" Bokrijk sees itself not only as a museum but as a platform for connecting heritage communities, both local and dispersed. For each building restored, the museum reaches out to the original village of origin, inviting communities to visit, celebrate, and re-engage with their built heritage. These *"community days"* often attract hundreds of visitors and are supported by articles in local newspapers and invitations to visit the site for free. The museum also fosters emotional and social reconnections through these events, highlighting the personal histories tied to buildings, such as former residents reuniting after decades apart.

From an educational perspective, the curator observed: "*You can consider the buildings as a menu… you want to see this kind of building technique, this is the place to learn.*" Bokrijk positions itself as a showroom and open lab for architectural students and professionals. Although collaboration could be expanded, the museum has partnered with universities like Hasselt and with architects to study thermal performance, material decay, and traditional ventilation through live experiments. A noted German experiment had

people live two weeks in a vernacular house during winter, revealing how romanticised views can overlook severe climatic limits.

In terms of skills transmission, Bokrijk operates a dedicated craftership and heritage unit, which maps, documents, and networks craftspeople across Flanders. Current focus areas include wattle and daub, and the unit has developed a free, multilingual online toolbox for documenting and teaching traditional techniques, emphasising ethical community engagement and informed consent in line with UNESCO guidelines. In the words of the curator: *"It's about equality, about fair transactions… your aunt, your uncle, your nephew, anyone involved must be informed and consent."*

At Makumbusho, communities build traditional houses, decentralising vernacular preservation and reinforcing cultural self-determination."

Architects working with Bokrijk are expected to possess not only technical knowledge but also a particular attitude: *"An open mind… a heart for it… vernacular architecture is not simple."* The museum thus encourages architects to see tradition not as a constraint, but as a form of ingenuity that demands respect and contextual sensitivity.

Figures 2–5 visually illustrate how vernacular knowledge is enacted, transmitted, and publicly mediated within the open-air museum context. They demonstrate how construction processes are made visible to visitors, how craft skills are performed and learned in real time, and how intergenerational participation sustains traditional building knowledge. Together, these images reinforce the argument that vernacular preservation is not merely about conserving physical structures but about activating living

FIGURE 2
Vernacular building under construction on an open site, enabling public visibility and engagement
Source: Author's fieldwork photograph, Bokrijk Open-Air Museum (2026)

FIGURE 3
Visitors at a vernacular building, reflecting and learning from a living past
Source: Author's fieldwork photograph, Bokrijk Open-Air Museum (2026)

FIGURE 4
Live mixing of construction materials, demonstrating knowledge transfer
Source: Author's fieldwork photograph, Bokrijk Open-Air Museum (2026)

FIGURE 5
Children observing and joining in the construction of a vernacular replica, showing intergenerational skill transfer
Source: Author's fieldwork photograph, Bokrijk Open-Air Museum (2026)

practices through engagement, experimentation, and shared learning.

Makumbusho Village Museum

In contrast to the institutional and financial capacity of Bokrijk, Makumbusho Open-Air Museum operates within more modest means but demonstrates a deeply embedded cultural model of community involvement. One manager stressed: *"The communities are at the center of every decision we make concerning the vernacular architecture."* The museum's exhibits primarily include traditional houses from various Tanzanian ethnic groups that are constructed and maintained through collaboration with elders, artisans, and community members.

At Makumbusho, community engagement is enacted through festivals, oral traditions, and participatory events. Elders and traditional builders are consulted not only during construction but also in the interpretation of house forms, materials, and symbolic features. The museum integrates this community knowledge into public programming through guided tours, traditional performances, and educational festivals, which are essential for both cultural preservation and public outreach.

The museum also plays an important role in preserving intangible heritage, particularly about construction techniques and pest-control methods rooted in indigenous ecological knowledge. As explained by a respondent: *"Smoking twice a week using traditional herbs… lighting fire every day."* These methods are not merely symbolic practices but functional solutions adapted to East Africa's climate.

Makumbusho supports informal academic collaboration, particularly with the University of Dar es Salaam, through field schools and research facilitation. Though these collaborations are not yet formalised, they reflect a growing awareness of the museum's potential as a teaching resource. The managers observed that: *"most of the exhibition presentation… is focused on the role of traditional houses in daily life,"* suggesting that the museum functions as an accessible site of applied cultural education for both students and the wider public.

Despite its success in community inclusion, Makumbusho faces several challenges. Environmental changes and forest regulations have made it harder to access some traditional materials, and certain plant species used in construction are becoming scarce. Additionally, the museum lacks sufficient funding to conduct large-scale documentation or restoration campaigns, unlike its European counterpart.

Nonetheless, Makumbusho's strength lies in its grassroots orientation. Community participation is not a curated experience but an ongoing process of co-creation. At Makumbusho, communities build traditional houses, decentralising vernacular preservation and reinforcing cultural self-determination. In terms of education, one manager emphasised: *"Every house built was keenly analyzed to fit a specific environment… which may be missing in current architecture."*

Figures 6 and **7** extend this visual analysis to the Makumbusho context, demonstrating how vernacular construction is embedded within community participation and educational outreach. The images highlight the decentralised and grassroots character of heritage preservation, where building activities remain socially situated

FIGURE 6
Construction of a vernacular building on an open site, enabling public visibility and engagement
Source: Author's fieldwork photograph, Makumbusho Village Museum, (2026)

FIGURE 7
School children visiting a vernacular building, bridging generations and learning from living heritage
Source: Author's fieldwork photograph, Makumbusho Village Museum, (2026)

and accessible to local audiences. In particular, the involvement of school children underscores the role of open-air museums in fostering early awareness of cultural heritage, reinforcing intergenerational continuity through observation, participation, and lived experience.

Comparative Matrix

Both museums sustain vernacular architecture but in different ways; Bokrijk through structured, well-resourced conservation, and Makumbusho through grassroots, community-led practices.

Table 1 synthesises the comparative findings across three central themes—resources, participation, and pedagogy—highlighting the institutional contrasts and shared objectives between Bokrijk and Makumbusho

In summary, Bokrijk and Makumbusho both sustain vernacular architecture through living practices, though in contrasting ways; one institutional and research-driven, the other grassroots and community-led. These results provide the foundation for the discussion, which interprets how such practices shape debates on education, conservation, and sustainability in architectural heritage.

DISCUSSION

This study set out to examine how community engagement in open-air museums contributes to the documentation and transmission of vernacular architecture, and what lessons these models offer for architectural education. The findings from Bokrijk and Makumbusho reveal that, despite contextual differences in funding, institutional scale, and heritage policy, both museums act as living repositories of traditional architectural

TABLE 1
Comparative summary across key themes

Theme	Bokrijk (Belgium)	Makumbusho (Tanzania)
Resources	Strong institutional backing with €25m funding (2017–2024); 124 buildings restored by in-house experts; faces material sourcing challenges from climate change.	Limited funding and reliance on community trust; restricted access to traditional materials; small-scale restorations
Participation	Outreach through community days; strong craft networks via Craftership & Heritage; prioritises consent and ethical engagement.	Grassroots-led; elders, artisans, and community co-create through construction, oral traditions, festivals, and live practices
Pedagogy	Acts as "open lab" with universities; online craft toolbox; test materials and thermal use.	Informal learning via tours, festivals, and university links, stresses indigenous ecological knowledge (e.g., pest control, smoke).

Source: Author's fieldwork data and institutional interviews, 2026

knowledge with communities placed at the heart of their practices. This affirms Waterton and Smith's (2010) argument that heritage is not simply about preserving material objects, but is a socially embedded process involving participation, memory, and meaning-making.

Education: Museums as Learning Laboratories

One of the clearest convergences is the educational potential of open-air museums. At Bokrijk, heritage is framed as an "open lab," where students, architects, and researchers experiment with full-scale reconstructions and traditional craft skills. Makumbusho, though operating with fewer institutional resources, provides parallel opportunities through festivals, exhibitions, and partnerships with local universities. Both settings create experiential learning environments outside the classroom, echoing Salama's (2015) call for a "trans-critical" pedagogy that blends cultural understanding, real-world engagement, and reflective practice.

Comparative examples show similar dynamics. Colonial Williamsburg has been analysed as a constructed educational space shaping national memory and public engagement with history (Carson, 1998). In South Africa, Bakoni Malapa Open Air Museum demonstrates how demonstrations of cultural practices and craftwork serve as effective tools for transmitting intangible heritage (Musinguzi & Kibirige, 2009). By contrast, Makumbusho in Tanzania shows that even under severe resource constraints, participatory approaches can still enrich architectural curricula, underscoring the pedagogical value of community-led engagement.

Conservation: Craft Knowledge and Intangible Heritage

A second theme is conservation. Bokrijk illustrates a highly structured model through its Craftership and Heritage unit, mapping endangered building techniques and integrating digital documentation. Makumbusho offers a less formal but equally vital approach, preserving craft traditions through lived practices such as herbal treatments, smoke-based pest control, and the involvement of elders in construction. Both align with the UNESCO Convention on Intangible Cultural Heritage (2003), highlighting the centrality of community knowledge in conservation.

Globally, Japan's preservation districts for traditional buildings demonstrate coordinated local community stewardship (Alvarez Fernandez, 2022). Nigeria's Sukur Cultural Landscape similarly relies on community custodianship and locally embedded practice (Afamefuna & Okonkwo, 2019; Tagowa, 2010). These brief comparisons underline that sustaining intangible skills is as critical as preserving physical structures.

Sustainability: Contrasting Models of Heritage Management

The two cases also reveal contrasting models of sustainability. Bokrijk benefits from long-term state subsidies, which enable systematic restoration and carefully curated educational programs. Makumbusho, by contrast, operates through a low-resource, high-participation model rooted in community trust and informal networks. As Munjeri (2004) argues, sustainability in heritage is not merely material but culturally anchored in continuity and relevance for communities.

Similar contrasts appear elsewhere; Japan's preservation districts illustrate state-community collaboration in heritage governance (Alvarez Fernandez, 2022), while studies from Asia and Africa highlight community-centric approaches operating under tighter resources (Banda et al., 2024; Li et al., 2020). Nigeria's Sukur, meanwhile, demonstrates how community custodianship underpins long-term sustainability (Tagowa, 2010). These comparisons, echoing the patterns observed in Bokrijk and Makumbusho, suggest that sustainability is shaped more by participatory resilience and local stewardship than by budgets.

Limitations and Transferability

This study centres on institutional perspectives, excluding artisans, students, and visitors, and compares only two museums, one European, one African. While not capturing global diversity, the focus provides depth on institutional orientations and offers transferable insights into how context, scale, and resources shape heritage education.

Implications for Architectural Education

For architectural curricula, the implications are profound. Both cases highlight the gap between conventional design training dominated by modernist aesthetics and international "best practices" and the lived realities of vernacular heritage (Asquith & Vellinga, 2006; Oliver, 2006).

Open-air museums offer counter-spaces where tacit knowledge, environmental adaptation, and cultural symbolism can be directly experienced. As climate change intensifies, the lessons of vernacular design, passive cooling, resource efficiency, and cultural rootedness are increasingly relevant (Correia et al., 2014; Xu et al., 2024).

Synthesis

Both Bokrijk and Makumbusho show that open-air museums serve as laboratories for sustainable design and intergenerational learning. Their contrasting models, state-supported and grassroots, demonstrate that heritage education can flourish in diverse contexts, urging architectural training to move beyond classrooms into living landscapes where culture and design intersect.

CONCLUSION

Open-air museums such as Bokrijk and Makumbusho show that community engagement and vernacular knowledge are essential for sustaining heritage and rethinking architectural education. Despite differences in scale and resources, both cases present museums as living laboratories, linking conservation, experiential learning, and cultural resilience.

Three central insights emerge. First, heritage must be understood as a lived practice; vernacular architecture cannot be conserved without the communities that produce and inhabit it. Second, open-air museums offer opportunities for experiential pedagogy, complementing and challenging conventional training. Finally, the contrast between Bokrijk's well-resourced, research-driven model and Makumbusho's grassroots, community-reliant approach underscores how institutional frameworks shape conservation and knowledge transfer.

At a time when climate change and cultural homogenisation threaten ecological balance and social memory, these cases show vernacular knowledge is not a relic but a foundation for resilient futures. Embedding such knowledge in education and policy ensures architecture remains contextually rooted and globally relevant, equipping future architects as custodians of cultural identity and environmental sustainability.

RECOMMENDATIONS

Building on these insights, the way forward requires phased but interconnected action. In the short term, universities should strengthen curricula by collaborating with open-air museums to provide immersive, practice-based learning experiences. Over the medium term, these collaborations should be expanded into joint research and documentation initiatives, enabling vernacular knowledge to be adapted for contemporary sustainability challenges. In the longer term, national policy frameworks need to institutionalise support for vernacular systems through stable funding, recognition of community custodianship, and the creation of cross-sector partnerships linking education, heritage management, and planning.

CITED REFERENCES

Adell, N., Bendix, R. F., Bortolotto, C., & Tauschek, M. (2015). *Between imagined communities of practice: Participation, territory and the making of heritage.* Göttingen University Press. https://doi.org/10.4000/books.gup.191

Afamefuna, E., & Okonkwo, E. E. (2019). Exploring the Sukur cultural landscape in Adamawa State of Nigeria: A methodological discussion. *Quality & Quantity,* 53(4), 2131–2141. https://doi.org/10.1007/s11135-019-00862-0

Aktürk, G., & Fluck, H. (2022). Vernacular heritage as a response to climate: Lessons for future climate resilience from Rize, Turkey. *Land*, 11(2), 276. https://doi.org/10.3390/land11020276

Ali, Z., & Zawawi, R. (2010). Contributions of open air museums in preserving heritage buildings: Study of open-air museums in South East England. *Journal of Design and Built Environment.*

Alvarez Fernandez, J. (2022). The role of governmental and community agents in the management of important preservation districts in Japan. *Journal of Asian Architecture and Building Engineering*, 21(5), 1859–1878. https://doi.org/10.1080/13467581.2021.1971678

Asquith, L., & Vellinga, M. (Eds.). (2006). *Vernacular architecture in the twenty-first century:*

Theory, education and practice. Taylor & Francis.

Avrami, E., Macdonald, S., Mason, R., & Myers, D. (2019). *Values in heritage management: Emerging approaches and research directions*. Getty Conservation Institute. Retrieved from https://publ.icomos.org/publicomos/jlbSai?html=Bur&base=technica&ref=43156&file=1836.pdf&path=9781606066195.pdf

Banda, L. O. L., Banda, C. V., Banda, J. T., & Singini, T. (2024). Preserving cultural heritage: A community-centric approach to safeguarding the Khulubvi Traditional Temple Malawi. *Heliyon,* 10(18), e37610. https://doi.org/10.1016/j.heliyon.2024.e37610

Berlanda, T. (2017). De-colonising architectural education: Thoughts from Cape Town. B, 1(3), 69–72. https://doi.org/10.1186/bf03545677

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Carson, C. (1998). Colonial Williamsburg and the practice of interpretive planning in American history museums. *The Public Historian*, 20(3), 11–51. https://doi.org/10.2307/3379773

Clarke, A. (2013). Constructing architectural history at the open-air museum. *Proceedings of the Society of Architectural Historians, Australia and New Zealand,* 30, 517–528. Retrieved from http://www.griffith.edu.au/conference/sahanz-2013/

Correia, M., Dipasquale, L., & Mecca, S. (2014). *Vernacular knowledge for sustainable architecture*. Firenze University Press.

Council of Europe. (2005). *Council of Europe framework convention on the value of cultural heritage for society.* Retrieved from https://www.coe.int/en/web/culture-and-heritage/faro-convention

Creswell, J. W. (2007). *Qualitative inquiry & research design: Choosing among five approaches* (2nd ed.). Sage.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (2018). *The SAGE handbook of qualitative research* (5th ed.). Sage.

Harrison, R. (2013). *Heritage: Critical approaches.* Routledge. https://doi.org/10.4324/9780203108857

Hu, M. (2023). Exploring low-carbon design and construction techniques. *Climate,* 11(8), 165. https://doi.org/10.3390/cli11080165

Iaione, C., De Nictolis, E., & Santagati, M. E. (2022). Participatory governance of culture and cultural heritage. *Frontiers in Sustainable Cities*, 4. https://doi.org/10.3389/frsc.2022.777708

Inam, A. I. (2025). Cultural homogenization and the decline of vernacular architecture. *International Journal for Multidisciplinary Research,* 7(2). https://doi.org/10.36948/ijfmr.2025.v07i02.39067

Joffroy, T. (Ed.). (2005). *Traditional conservation practices in Africa*. ICCROM.

Li, J., Krishnamurthy, S., Pereira Roders, A., & Van Wesemael, P. (2020). Community participation in cultural heritage management. *Cities,* 96, 102476. https://doi.org/10.1016/j.cities.2019.102476

Munjeri, D. (2004). Tangible and intangible heritage. *Museum International,* 56(1–2), 12–20. https://doi.org/10.1111/j.1350-0775.2004.00453.x

Musinguzi, D., & Kibirige, I. (2009). The role of cultural and heritage education at Bakoni Malapa open air museum. *International Journal of Intangible Heritage,* 4, 151–158.

Nasrolahi, A., Messina, V., & Gena, C. (2022). Community engagement in the Bisotun World Heritage Site. In *Proceedings of the AVI-CH Workshop.* Retrieved from https://ceur-ws.org/Vol-3243/paper6.pdf

Ndoro, W., & Wijesuriya, G. (2015). Heritage management and conservation. In L. Meskell (Ed.), *Global heritage* (pp. 131–149). Wiley. https://doi.org/10.1002/9781394261154.ch6

Oliver, P. (2006). *Built to meet needs: Cultural issues in vernacular architecture.* Architectural Press.

Pardo, J. M. F. (2023). Challenges and current research trends for vernacular architecture. *Buildings,* 13(1), 162. https://doi.org/10.3390/buildings13010162

Patnaik, S., & Pandey, S. C. (2019). Case study research. In R. N. Subudhi & S. Mishra (Eds.), *Methodological issues in management research* (pp. 163–179). Emerald Publishing. https://doi.org/10.1108/978-1-78973-973-220191011

Patton, M. Q. (2010). *Qualitative research & evaluation methods* (3rd ed.). Sage.

Salama, A. (2015). *Spatial design education*. Ashgate.

Salama, A. M., Burton, L. O., & Patil, M. P. (2025). ADAPT2SDG. *The Journal of Architecture.* https://doi.org/10.1080/13602365.2025.2556946

Salama, A., & Wilkinson, N. (Eds.). (2007). *Design studio pedagogy*. Urban International Press.

Smith, L. (2006). *Uses of heritage.* Routledge.

Tagowa, W. N. (2010). Rural tourism as a factor of sustainable development. In *Sustainable tourism* (pp. 675–688). WIT Press. https://doi.org/10.2495/SW100611

UNESCO. (2003). *Convention for the safeguarding of the intangible cultural heritage*. Retrieved from https://ich.unesco.org/doc/src/01852-EN.pdf

UNESCO. (2024). *Future building: Towards a sustainable habitat.* UNESCO Courier. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000388425_eng

Vellinga, M., Oliver, P., & Bridge, A. (2024). *Atlas of vernacular architecture of the world* (1st ed.). Routledge. https://doi.org/10.4324/9781003572459

Wang, X., Hu, Y., Zhang, Z., & Zhang, B. (2022). The application of thymol-loaded chitosan nanoparticles. *Journal of Cultural Heritage*, 53, 206–211. https://doi.org/10.1016/j.culher.2021.12.002

Waterton, E., & Smith, L. (2010). The recognition and misrecognition of community heritage. *International Journal of Heritage Studies,* 16(1–2), 4–15. https://doi.org/10.1080/13527250903441671

Xu, W., Wang, Q., Deng, H., & Zhu, Z. (2024). Sustainable design strategies of vernacular architecture. PLOS ONE, 19(12), e0316518. https://doi.org/10.1371/journal.pone.0316518

Yang, N., Chen, B., & Xi, J. (2024). A theoretical design framework of contemporary vernacular architecture. *Buildings,* 14(11), 3525. https://doi.org/10.3390/buildings14113525