

SUSTAINABLE URBAN INTEGRATION OF DALA HILLS THROUGH HERITAGE LANDSCAPE DESIGN

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ABSTRACT

The Dala Hills, once a hub of Kano's urban civilization, are facing neglect, encroachment, and ecological decline due to rapid urbanization. The research problem is balancing the preservation of Dala Hills' cultural and ecological heritage with the demands of modern urban development. This study adopts a qualitative landscape and heritage design approach to explore pathways for the sustainable reintegration of Dala Hills into Kano's urban framework. Using stakeholder interviews, spatial appraisal, and historical analysis, the research identifies design opportunities that align cultural heritage with ecological restoration and community well-being. Findings reveal that the absence of heritage-sensitive planning and weak institutional collaboration have contributed to the site's deterioration. The study recommends the creation of inclusive public spaces, the adaptive reuse of cultural landscapes, and the integration of green infrastructure for climate resilience and tourism enhancement. By embedding Dala Hills within a broader urban sustainability framework, the research demonstrates how heritage-led landscape design can transform it into a multifunctional space, serving as a cultural landmark, ecological refuge, and civic hub. The paper concludes that strategic policy alignment and participatory planning are essential to reposition Dala Hills as a living heritage within the evolving urban fabric of Kano.

KEYWORDS: Cultural heritage, Dala Hills, Green infrastructure, Landscape design, Urban sustainability

INTRODUCTION

Dala Hill, or Dalla Hill, is a major geomorphological and cultural landmark in Kano, Nigeria, and the cradle of the city's civilization and spiritual identity, dating back to the 7th century CE with the *Tsumburbura* shrine (Falola & Heaton, 2008). Historically, it shaped Kano's spatial and cultural evolution, influencing the development of the city's defensive walls and gates (Sani, 2017). However, the site now faces significant ecological degradation and spatial neglect caused by rapid urbanization, weak regulation, and poor conservation practices. Ongoing threats include

erosion, deforestation, informal construction, and waste accumulation, exacerbated by fragmented interventions and limited community participation (Garba, 2019; Yusuf, 2020).

These challenges mirror global debates on integrating historic landscapes into modern urban systems through heritage urbanism, which reframes heritage sites as active components of sustainable cities (Bandarin & van Oers, 2012). The UNESCO Historic Urban Landscape (HUL) approach reinforces this by advocating adaptive and participatory management that connects heritage values with contemporary urban needs

(UNESCO, 2011). In this context, Dala Hill presents an opportunity to harmonize cultural preservation, ecological restoration, and inclusive urban development in line with Sustainable Development Goal 11 (United Nations, 2015). This study, therefore, develops a heritage landscape design framework aimed at reintegrating Dala Hill into Kano's urban system, advancing cultural continuity, environmental resilience, and community well-being, transforming it from a neglected relic into a vibrant, multifunctional landscape that strengthens the city's identity and sustainability.

The Dala Hill landscape, despite its cultural and historical significance, is deteriorating due to urban expansion, weak institutional coordination, and inadequate heritage-sensitive planning. This study aims to develop a heritage landscape design framework that promotes sustainable urban reintegration of Dala Hills by combining cultural preservation, ecological restoration, and community participation. The study examines the historical, spatial, and ecological evolution of Dala Hills, identifies factors contributing to its decline, explores design opportunities, and proposes a conceptual heritage landscape design framework aligned with global sustainability and heritage conservation goals.

LITERATURE REVIEW

Heritage Landscapes and Urban Transformation

Heritage landscapes represent the dynamic interaction between people, place, and time, embodying both tangible and intangible values that sustain cultural identity and environmental adaptation (Bandarin &

van Oers, 2012). In African contexts, sacred hills, royal precincts, and ancient markets historically shaped urban form and social cohesion (Falola & Heaton, 2008). Yet, postcolonial modernization and unregulated urban expansion have often marginalized these spaces, turning them into fragmented relics within rapidly growing cities (Mensah, 2019). In the case of Dala Hills, this marginalization appears through neglect, informal encroachment, and ecological decline, eroding its cultural and environmental significance. Contemporary scholarship advocates a shift toward *heritage urbanism*, an approach that reintegrates heritage landscapes into active urban systems to promote multifunctionality and resilience (Graham & Howard, 2020). This study aligns with that view, positioning Dala Hills as a regenerative landscape that can simultaneously advance ecological restoration, reinforce cultural identity, and enhance social inclusion.

The Historic Urban Landscape (HUL) Approach

The Historic Urban Landscape (HUL) approach, endorsed by UNESCO (2011), offers a comprehensive framework for integrating cultural heritage into sustainable urban development. It broadens heritage management from isolated monuments to encompass the wider urban context, topography, spatial patterns, natural systems, and living traditions, guided by principles of knowledge, integrated planning, inclusive governance, and capacity building (Bandarin & van Oers, 2015). By embedding heritage within participatory urban policy, HUL promotes a balance between conservation and development. In cities like Kano, where traditional cores

intersect with expanding modern districts, the framework provides a tool for harmonizing continuity and change. Its relevance to Dala Hills lies in its holistic view, recognizing the interdependence of the hill's cultural, ecological, and spatial systems. Aligned with Sustainable Development Goal 11 (United Nations, 2015), HUL supports adaptive and participatory strategies that position Dala Hills as part of a living urban ecosystem rather than a static heritage site.

Green and Blue Infrastructure (GBI) in Heritage Contexts

Green and Blue Infrastructure (GBI) encompasses interconnected natural and semi-natural systems, such as vegetation, water bodies, and open spaces, that deliver ecological and social benefits (Benedict & McMahon, 2012). When integrated into heritage landscapes, GBI enhances environmental resilience while maintaining cultural integrity. In semi-arid contexts like northern Nigeria, GBI strategies such as urban forestry, water harvesting, and soil stabilization can reduce heat stress, erosion, and land degradation (Kalu et al., 2025). Scholars highlight that many heritage landscapes were historically adaptive to local climates, offering models for contemporary sustainable design (Gunasekaran & Shanthi Priya, 2025; Zhang et al., 2024). Hausa courtyard forms and sacred groves, for example, exemplify climate-sensitive design principles that foster shade, ventilation, and community interaction. Embedding these vernacular logics within modern GBI planning transforms heritage sites from static cultural symbols into active agents of urban resilience. In this study, GBI provides the ecological foundation for reintegrating Dala Hills, supporting

flood regulation, microclimate improvement, and biodiversity restoration.

Participation and Co-Design in Heritage Landscape Management

Sustainable heritage management increasingly relies on participatory governance and community engagement (Waterton & Smith, 2010). In many African settings, top-down conservation has been ineffective because it marginalizes traditional custodians and living cultural practices (Yusuf, 2020). The Historic Urban Landscape (HUL) approach promotes inclusive participation by engaging multiple stakeholders—government agencies, researchers, traditional leaders, and residents—in value assessment and decision-making. For Dala Hills, where custodians and artisans possess deep historical knowledge, participatory co-design ensures that interventions align with community values and traditions. This study adopts participation as both a guiding principle and a methodological approach, consistent with Bryman's (2016) emphasis on triangulation and stakeholder validation. Integrating local insights with spatial and ecological data enhances legitimacy, ownership, and contextual responsiveness. Moreover, participatory governance fosters long-term sustainability by cultivating local stewardship, reducing dependency on external actors, and ensuring that heritage reintegration into Kano's urban system remains socially and environmentally resilient.

Integrating Thematic Linkages

The reviewed literature reveals four interconnected themes, heritage continuity, ecological resilience, urban integration, and community participation, as central to sustainable

heritage landscape management. Heritage continuity anchors cultural identity and historical memory; the Historic Urban Landscape (HUL) approach provides a framework for harmonizing conservation and development; green and blue infrastructure (GBI) introduces ecological resilience; and participatory processes ensure inclusivity and local ownership (Bandarin & van Oers, 2012; UNESCO, 2011; Benedict & McMahon, 2012; Waterton & Smith, 2010). Collectively, these themes establish a multidimensional foundation for reimagining Dala Hills as a dynamic heritage landscape where cultural memory, ecological systems, and urban life intersect. This synthesis emphasizes that sustainable integration extends beyond physical design to encompass governance, cultural continuity, and social inclusion. By positioning Dala Hills within this framework, the study highlights how heritage landscapes can serve as catalysts for climate adaptation, spatial equity, and cultural revitalization in contemporary urban contexts.

METHODOLOGY

This study adopts a qualitative case study approach to investigate the sustainable integration of Dala Hills into Kano's contemporary urban framework. The case study method enables a context-sensitive exploration of how cultural heritage, ecology, and community values interact within a single complex landscape system (Yin, 2018; Creswell & Poth, 2018).

Research Design and Theoretical Framework

The methodological framework integrates four complementary perspectives: heritage landscape theory, the Historic Urban Landscape (HUL)

approach, green-blue infrastructure (GBI), and participatory planning. The heritage landscape perspective interprets Dala Hills as a living system shaped by cultural memory and ecological processes (Stephenson, 2008). The HUL approach (UNESCO, 2011) situates the site within broader urban dynamics, emphasizing continuity between tangible and intangible values. GBI principles guided the ecological appraisal of the hill's vegetative cover, water systems, and restoration potential (Benedict & McMahon, 2012). Participatory planning ensured that local voices and indigenous custodianship informed design outcomes (Innes & Booher, 2015).

Data Collection

Data for the study were collected through three complementary methods to ensure a comprehensive understanding of the Dala Hills landscape. First, a document and archival review was conducted, examining historical maps, urban development plans, and official reports from government and academic sources to trace land-use transitions and past institutional interventions (Neuman, 2014). Second, spatial appraisal involved detailed field observations and GIS mapping to document land degradation, vegetation distribution, and informal human activities, thereby visualizing the spatial and ecological conditions of Dala Hills (Longley et al., 2015). Third, stakeholder engagement was carried out through semi-structured interviews and two focus group discussions, involving a total of 24 purposively selected participants representing cultural custodians, administrative officials, and technical experts. This multi-method approach allowed for the triangulation of evidence

and integration of both qualitative and spatial insights into the study.

Selection was guided by participants' direct involvement with the site or their expert knowledge of cultural heritage, planning, or landscape management. The engagement process focused on perceptions of the hill's values, threats, and opportunities for sustainable integration.

Data Analysis and Validation

All interviews were recorded, transcribed, and examined through thematic analysis, a method effective for identifying patterns and relationships across qualitative data (Nowell et al., 2017). This approach enabled interpretive understanding of stakeholder perspectives, incorporating both predefined themes, heritage, ecology, and participation, and emergent insights (Braun & Clarke, 2019). Data coding followed three stages: familiarization, categorization, and theme refinement. To enhance reliability and validity, interview findings were triangulated with spatial and documentary data (Flick, 2018), while stakeholder feedback sessions confirmed contextual accuracy and shared ownership. Ethical protocols, including institutional approval, informed consent, and confidentiality, were strictly followed. Overall, this participatory and integrative methodology established a solid basis for developing a heritage landscape framework that bridges cultural preservation, ecological restoration, and inclusive urban regeneration in Dala Hills.

RESULTS

Findings from the document review, spatial appraisal, and stakeholder engagement reveal a multidimensional picture of Dala Hills' current conditions and its potential for sustainable urban integration. The results are organized under three broad themes: (1) historical and ecological transitions; (2) spatial conditions and land-use dynamics; and (3) stakeholder perspectives on heritage integration and design opportunities.

Historical and Ecological Transitions

Archival and documentary analysis shows that Dala Hills has undergone significant transformation from a sacred and administrative core in precolonial Kano to a marginalized peri-urban space. Early maps and colonial records (1900–1960) identified the hill as a strategic topographical and spiritual reference point. However, post-independence urban expansion displaced its cultural centrality, replacing traditional open spaces with dense residential and commercial encroachments.

Environmental records and site observations reveal that vegetation cover has reduced by approximately 60% over the past four decades (Table 1). This degradation is primarily attributed to unregulated construction, tree felling for fuel, and uncontrolled runoff during rainy seasons. Evidence of soil erosion, waste accumulation, and loss of native flora was noted on multiple hill slopes, confirming weakened ecological resilience

Table 1: Summary of Land Use and Environmental Changes in Dala Hills (1980–2025)

Indicator	1980s	2000s	2025 (Current Observation)	Trend / Comment
Vegetation cover	Dense native shrubs and trees	Moderate cover with patches cleared	Sparse vegetation on slopes and the summit	Severe loss of flora due to urban pressure
Built-up area	Limited residential clusters	Expansion of informal housing	Dominant mixed-use encroachments	Uncontrolled settlement growth
Soil erosion	Minor natural erosion	Increased runoff during rain	Major gullies along pathways and slopes	Requires re-vegetation and drainage design
Cultural landmarks (shrines, relics)	Intact and active	Reduced cultural activity	Some sites are abandoned or vandalized	Weak institutional protection
Waste accumulation	Minimal	Moderate	High, particularly near access roads	Absence of waste management

Spatial Appraisal

The GIS-based spatial analysis reveals three dominant land-use zones within and around Dala Hills, as shown in Figure 1:

1. Sacred core zone (Summit area): Contains remnants of the *Tsumburbura* shrine and ancient observation points. It remains culturally significant but physically degraded.
2. Transitional residential belt: Characterized by dense informal housing, inadequate drainage, and limited green cover.
3. Peripheral commercial interface: Hosts markets, workshops, and small-scale trading, exerting pressure on access roads and open spaces.

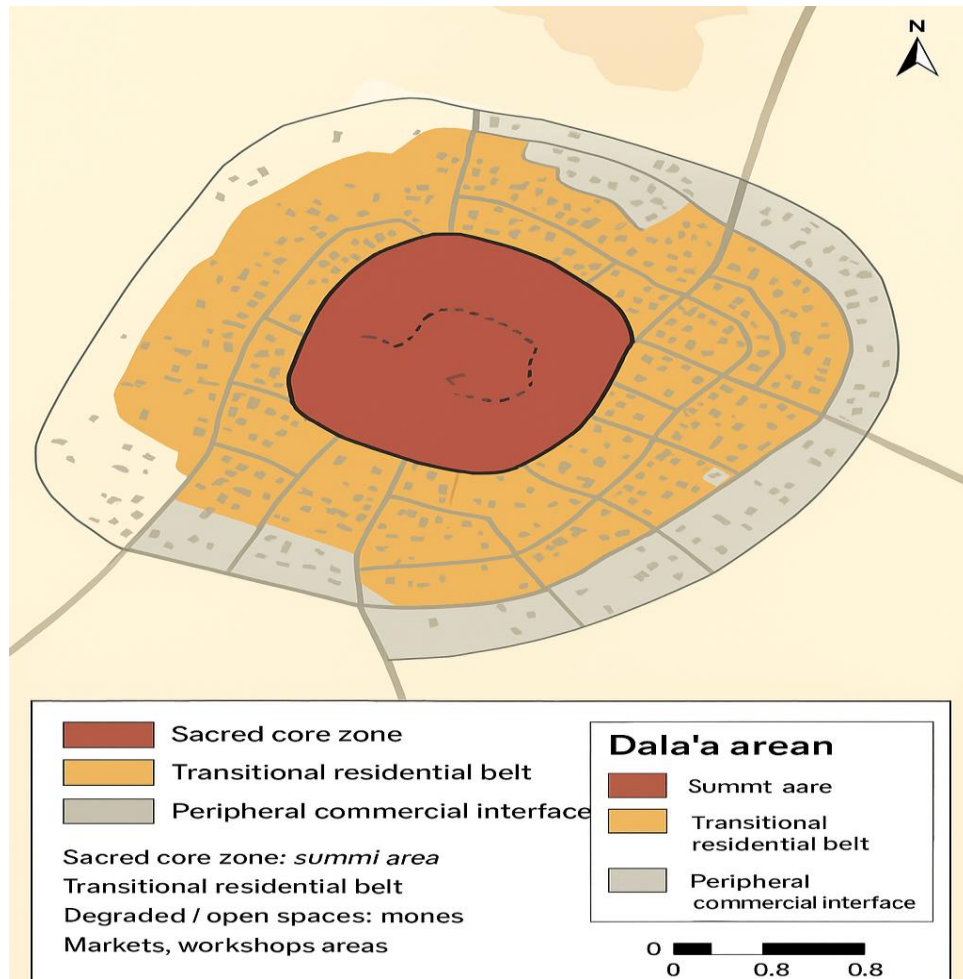


Figure 1: Field survey and GIS mapping, 2025

Field photographs and mapping confirm that only 18% of the hill's area retains natural vegetation, while 58% is now

built-up. The remaining 24% comprises transitional or degraded open space.

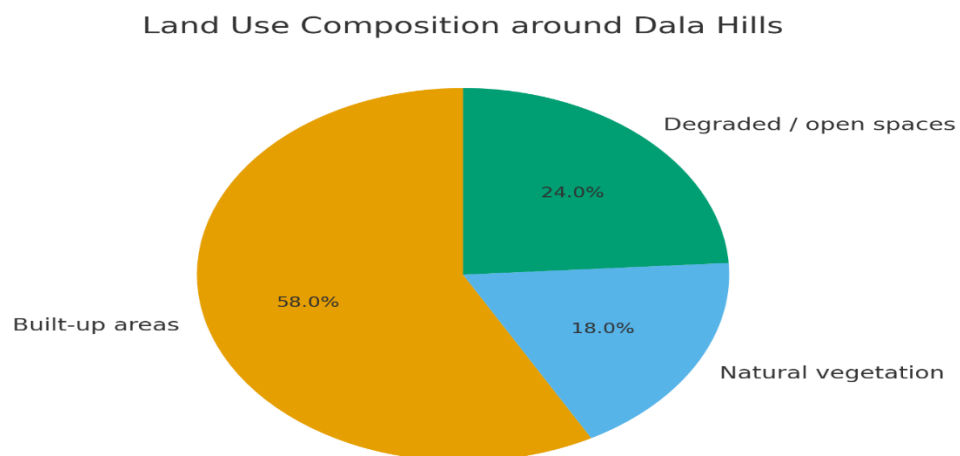


Figure 2: Land use composition of Dala hills (2025)

Stakeholder Engagement Results

Interviews and focus group discussions generated rich qualitative insights, grouped into four thematic areas that reflect stakeholders' shared concerns and aspirations.

- i. **Cultural Identity and Heritage Value:** All five traditional custodians emphasized the spiritual and symbolic importance of Dala Hills as the origin of Kano civilization. However, they expressed frustration over the declining respect for conventional boundaries and the lack of inclusion in modern planning processes.

“Dala Hills is the very heart of our history; it is where Kano began,”
The custodian of the site.

“But today, people no longer respect the sacred boundaries, and we are not consulted when new developments take place. It feels like our heritage is being forgotten.” Administrative officials

- ii. **Ecological and Landscape Concerns:** Environmental officers and residents highlighted the combined effects of erosion, deforestation, and waste pollution as key threats. Participants called for re-greening initiatives using native tree species and small-scale water retention systems to restore the hill's microclimate.
- iii. **Governance and Institutional Challenges:** Urban planners and ministry officials acknowledged overlapping mandates and weak

coordination between heritage and environmental agencies. They pointed to the absence of a formal management plan as the main obstacle to integrated action.

- iv. **Design and Integration Opportunities:** Across stakeholder groups, there was broad support for developing Dala Hills as a multifunctional heritage landscape. Participants recommended creating shaded walkways, cultural interpretation trails, and small viewing plazas, integrating ecological restoration with public use.

“Shaded walkways, interpretive trails, and small viewing plazas can help visitors connect with the landscape, while ecological restoration ensures the site remains resilient and sustainable.” Technical expert

DISCUSSIONS

The study's findings reveal that the degradation of Dala Hills is driven by a combination of spatial neglect, institutional fragmentation, and unregulated urban expansion. The GIS-based spatial analysis shows that built-up areas now occupy approximately 58% of the total land area, indicating extensive encroachment that disrupts both ecological functions and cultural visibility. This finding corresponds with Yusuf (2020), who observes that rapid urbanization across Northern Nigerian cities has marginalized heritage landscapes, leading to environmental decline and the erosion of cultural memory. The remaining 18% of natural vegetation and 24% of degraded or open spaces confirm the urgency of

establishing a landscape restoration framework that balances urban growth with ecological resilience.

Heritage Landscapes and Sustainable Urbanism

The findings affirm that heritage landscapes such as Dala Hills possess latent potential to anchor sustainable urban regeneration. This aligns with Bandarin and van Oers (2012), who argue that heritage should be reinterpreted as a dynamic driver of contemporary urban sustainability rather than a static monument. The sacred core zone, containing the remnants of the *Tsemburbura* shrine, represents not only a cultural landmark but also a potential nucleus for heritage-led tourism and environmental education. Adaptive reuse of such cultural landscapes can reinforce identity while revitalizing community engagement, echoing the perspective that heritage integration enhances both social cohesion and spatial resilience (Jokilehto, 2018).

The Relevance of the HUL Approach

The Historic Urban Landscape (HUL) approach provides a conceptual and practical basis for balancing conservation with modernization. The framework emphasizes a layered understanding of urban heritage, integrating tangible and intangible values in planning processes (UNESCO, 2011). In Dala Hills, the lack of coordination among planning agencies and custodians, highlighted through stakeholder interviews, illustrates the absence of an operational HUL mechanism. Institutional synergy and participatory governance are thus critical for translating the HUL approach into policy and design practice, as seen in comparable African heritage cities such

as Stone Town, Zanzibar (Bandarin & van Oers, 2012).

Integrating Green–Blue Infrastructure (GBI)

The spatial data confirm ecological degradation across the Dala Hill slopes, with erosion, deforestation, and surface runoff as recurring issues. Integrating Green–Blue Infrastructure (GBI) strategies, such as vegetative buffers, bioswales, and terraced reforestation, can enhance ecological function while restoring landscape aesthetics. Kalu et al. (2025) argue that GBI enhances microclimatic regulation and biodiversity in arid urban environments, providing both ecological and cultural benefits. Applying these principles within Dala Hills can transform degraded land into multifunctional ecological corridors that support both heritage conservation and climate adaptation.

Participation and Local Stewardship

Stakeholder engagement findings underscore that local custodians and artisans remain central to the stewardship of Dala Hills. Their experiential and indigenous ecological knowledge offers valuable guidance for sustainable restoration. This supports Bryman (2016), who emphasizes that participatory frameworks promote legitimacy, inclusivity, and continuity in community-based projects. Effective co-design processes, where traditional custodians, planners, and residents collaboratively define design priorities, can bridge formal planning with local agency, ensuring long-term sustainability and ownership.

Toward an Integrated Heritage Landscape Framework

Overall, the study demonstrates that sustainable urban integration of Dala Hills requires a multi-scalar, heritage-led landscape design framework grounded in HUL principles, ecological infrastructure, and participatory governance. This integrated perspective not only responds to the research problem of balancing preservation with modernization but also offers a transferable model for heritage landscapes across sub-Saharan Africa. By aligning cultural continuity with environmental performance, Dala Hills can evolve from a neglected historic site into a vibrant civic and ecological landmark that strengthens Kano's identity and resilience in the face of urban transformation.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the sustainable urban integration of Dala Hills through the lens of heritage landscape design, emphasizing how cultural preservation, ecological restoration, and participatory planning can be harmonized within a rapidly urbanizing context. The findings revealed that uncoordinated development, weak institutional collaboration, and inadequate heritage-sensitive planning have accelerated the physical and cultural deterioration of the hill. GIS analysis confirmed that built-up areas now dominate more than half of the site, while natural vegetation continues to diminish—underscoring the need for urgent landscape rehabilitation and protection measures.

By situating Dala Hills within the frameworks of the Historic Urban Landscape (HUL) approach and Green–Blue Infrastructure (GBI) planning, the study demonstrates how heritage

landscapes can serve as catalysts for sustainable urban regeneration. Integrating indigenous knowledge with contemporary design tools provides opportunities to restore ecological balance, enhance cultural visibility, and foster civic pride. The involvement of traditional custodians, planners, and residents throughout the study reaffirmed that inclusive, community-driven stewardship is vital to sustaining the site's environmental and cultural values.

Accordingly, the research concludes that the sustainable future of Dala Hills lies in a heritage-led landscape design framework that redefines it as a multifunctional urban landscape — one that simultaneously preserves historical identity, supports ecosystem services, and strengthens social cohesion. Such a framework requires strong policy alignment between heritage and planning institutions, investment in green infrastructure, and continuous community participation. If effectively implemented, Dala Hills can transition from a neglected heritage site into a vibrant civic, ecological, and cultural landmark that embodies Kano's resilience and identity in the 21st century.

Summary of Findings

Dala Hills, once the cultural and spiritual hub of Kano, has experienced significant urbanization, weak institutional coordination, and inadequate heritage-sensitive planning. The area now comprises 58% built-up, 18% natural vegetation, and 24% degraded or transitional. Stakeholder interviews revealed erosion of traditional stewardship systems and limited community participation in planning processes. However, local custodians,

artisans, and residents expressed a strong willingness to engage in conservation and redevelopment efforts if empowered through inclusive governance mechanisms. The study calls for policy realignment that integrates heritage conservation within urban development legislation, enabling cross-sectoral collaboration and funding for landscape rehabilitation. Empowering traditional custodians and residents through co-design, training, and adaptive reuse initiatives can foster collective ownership and strengthen the cultural identity of Dala Hills.

Recommendations

To ensure the sustainable reintegration of Dala Hills into Kano's urban fabric, three interrelated areas of intervention are proposed:

1. **Policy Integration:** Heritage conservation should be mainstreamed into urban and environmental policy through a unified Heritage and Landscape Management Framework. This framework should promote inter-agency collaboration among cultural heritage authorities, urban planning departments, and environmental agencies to coordinate actions on land-use control, tourism development, and ecological restoration.
2. **Planning and Design Practice:** Urban planners and landscape architects should adopt the Historic Urban Landscape (HUL) and Green-Blue Infrastructure (GBI) approaches to guide site-specific interventions. These strategies can enhance ecosystem services, improve microclimate regulation, and protect sacred and historical zones while accommodating sustainable urban growth.
3. **Community Engagement:** Traditional custodians, residents, and local artisans should be engaged as co-design partners in all planning and redevelopment phases. Establishing a Community Heritage Trust or local management committee will ensure long-term stewardship, cultural continuity, and shared ownership of conservation outcomes.

Collectively, these recommendations emphasize that Dala Hills can evolve from a neglected landmark into a living heritage landscape, a resilient cultural, ecological, and civic asset contributing to Kano's sustainable urban future.

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