

Reinterpreting the Bulus in the Mihrab of Masjid Agung Demak: Cultural Symbolism, Architectural Sustainability, and Community- Based Conservation

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Abstract. The degradation of coastal environments and the loss of cultural identity in heritage architecture due to climate change and urban development have raised concerns about the relevance of traditional symbols in promoting sustainability. In the case of Masjid Agung Demak—Indonesia’s oldest mosque and a spiritual legacy of the Wali Songo—the presence of the bulus (softshell turtle) motif in the mihrab invites deeper reflection on its contemporary significance. This research investigates how the bulus, traditionally viewed as a symbol of balance and resilience in Javanese cosmology, can be scientifically reinterpreted as an ecological and cultural emblem within Islamic architectural heritage. The objective of this study is to explore the potential of the bulus motif to inform regenerative conservation strategies that integrate spiritual symbolism with environmental sustainability. Using a qualitative method that combines architectural semiotics, cultural anthropology, and sustainability discourse analysis, the study identifies the bulus as a nexus of spiritual, ecological, and communal meanings. Findings reveal that the motif is not merely decorative but functions as a biocultural signifier that embodies Islamic-Javanese values of patience, adaptability, and environmental stewardship. Recontextualizing the bulus within sustainability narratives enables a participatory model of heritage conservation that fosters local ecological awareness and reinforces community resilience amid ongoing environmental challenges.

Keywords: bulus; Masjid Agung Demak; Islamic architecture; heritage symbolism; sustainability

I. Introduction

In the face of accelerating climate change, sea-level rise, and environmental degradation, architectural heritage is increasingly called upon to serve not only as a repository of cultural identity but also as a reservoir of sustainability values. Historic buildings, especially those embedded in religious and indigenous traditions, often contain encoded wisdom—spatial, symbolic, and ecological—that can inform contemporary efforts to build resilience and foster community-based adaptation. One such site of convergence between heritage and sustainability is the Masjid Agung Demak, Indonesia’s oldest surviving mosque, built in the 15th century under the spiritual and architectural guidance of the Wali Songo, the revered nine saints who played a foundational role in the Islamization of Java [1].

While the mosque has long been studied for its architectural form, spiritual symbolism, and political significance in the early Islamic Kingdom of Demak [2], one less explored yet profoundly meaningful feature lies in its mihrab: a carving of the bulus (softshell turtle). This motif—seemingly peripheral in conventional architectural analyses—carries deep resonances in Javanese cosmology, Islamic symbology, and local ecological consciousness. In traditional belief systems, the bulus represents balance, patience, and protection. When situated within a sacred space such as the mihrab, the bulus can be read as an intentional metaphor—one that bridges the spiritual realm with the ecological realities of its place [3].

This paper seeks to reinterpret the bulus motif not as an ornamental or archaic remnant, but as a living symbol of resilience and environmental stewardship, particularly urgent in the context of Demak’s current ecological crisis. The region is among the most severely affected

coastal areas in Central Java, experiencing rapid land subsidence, tidal flooding (rob), mangrove degradation, and displacement of entire villages. In prior research, including work by Dian Awaliyah [4] on Demak's coastal conflict, the environmental degradation in this region is both an ecological and a social emergency, demanding adaptive strategies that are locally grounded, culturally meaningful, and ecologically sound.

In this light, the symbolic presence of the bulus in the mihrab of Masjid Agung Demak invites a deeper reexamination through three interconnected lenses: cultural-symbolic, ecological, and communal-regenerative. Together, these perspectives illuminate how a seemingly modest architectural motif can serve as a powerful conduit between the spiritual, the environmental, and the social.

From a cultural-symbolic standpoint, the bulus embodies indigenous meanings that are deeply rooted in Javanese cosmology and Islamic moral teachings. Traditionally regarded as a sacred creature associated with patience, protection, and balance, the bulus holds a liminal role—dwelling between land and water, the earthly and the spiritual. Its placement within a sacred architectural space like the mihrab, a focal point of Muslim prayer, is far from incidental. Rather, it reflects a carefully chosen symbol that resonates with the values of moderation (tawazun), custodianship (khalifah), and interconnectedness with nature, as upheld in both local wisdom and Islamic environmental ethics.

From an ecological perspective, the bulus is a native species to wetlands and brackish coastal zones, environments that are now among the most endangered in Demak due to ongoing land subsidence, tidal flooding, and mangrove loss. As a species sensitive to habitat changes, the bulus functions as a bioindicator—its presence or decline signals the overall health of aquatic ecosystems. In this role, the bulus serves not only as a metaphor but also as a tangible reminder of ecological fragility. Its symbolic invocation within heritage architecture challenges us to reconsider the intimate relationship between built form and environmental conditions, especially in a region facing severe climate-induced threats.

Finally, from a communal and regenerative lens, reactivating the bulus motif offers an opportunity to foster participatory conservation, architectural education, and local stewardship. When interpreted in ways that resonate with current environmental realities, the bulus can inspire a new generation to see their cultural heritage as a living resource—one that holds not just historical significance but practical relevance [5]. Educational programs, storytelling, community workshops, and eco-tourism initiatives that integrate this symbol can reinforce a sense of pride and shared responsibility, bridging ancestral knowledge with contemporary sustainability efforts.

In uniting these lenses, the bulus emerges not as a static emblem of the past, but as a dynamic cultural and ecological touchstone—one capable of guiding communities toward a more harmonious and resilient future.

By drawing upon interdisciplinary frameworks—including architectural semiotics, cultural anthropology, and sustainability science—this study positions the bulus as a nexus of biocultural heritage. It argues that such symbolic elements, when critically reinterpreted and socially reembedded, can play transformative roles in shaping regenerative conservation approaches. These approaches go beyond preservation by activating heritage to serve present-day climate challenges and future ecological imagination.

Ultimately, this paper contributes to emerging scholarship on eco-theological architecture, Islamic environmental ethics, and community-based adaptation. It calls for a shift in heritage discourse—one that sees sacred architecture not merely as a legacy of the past but as a platform for resilience, ecological dialogue, and regenerative futures.

2. Methods

This study adopts a qualitative interpretive approach to explore the symbolic, ecological, and architectural significance of the bulus motif in the mihrab of Masjid Agung Demak. The methodology draws on the intersecting disciplines of architectural semiotics, cultural anthropology, and sustainability discourse analysis to uncover the layered meanings embedded in this traditional element. The research process began with a visual analysis of the mosque's architectural features, with particular attention to the placement, form, and stylistic integration of the bulus within the mihrab. This visual inquiry served as a foundation for interpreting how spatial and symbolic design communicates cultural values.

To contextualize these observations, the study engaged in an extensive literature review encompassing historical accounts of Masjid Agung Demak, Javanese cosmology, Islamic mystical thought, and contemporary discourses on heritage and sustainability. The review included both classical sources and recent academic studies, enabling a dialogical interpretation that bridges past meanings and present urgencies.

Fieldwork was conducted through in-depth interviews with key stakeholders, including local religious leaders, cultural historians, conservation activists, and community elders in Demak. These conversations offered insights into how the bulus is understood today—whether as myth, memory, or moral guidance—and how such interpretations influence local perceptions of environmental responsibility. In addition, participatory observation was carried out during community-based conservation activities such as mangrove replanting and eco-religious gatherings, providing a firsthand view of how cultural symbols are integrated into ecological action.

Data from visual analysis, literature review, interviews, and observations were thematically analyzed to identify core patterns and symbolic resonances. This approach enabled a triangulation of perspectives, ensuring that the interpretation of the bulus motif was not only theoretically grounded but also culturally and socially informed. Through this method, the study constructs a nuanced understanding of the bulus as a living symbol—one that can guide contemporary approaches to architectural heritage, sustainability, and community resilience.

3. Results and Discussion

Constructed circa 1479 CE, Masjid Agung Demak is a syncretic masterpiece that fuses Islamic principles with Javanese aesthetics and spiritual symbolism. The mosque's traditional roof, saka guru (four main columns), Lawang Bledheg [6], and ornamentation reflect an intentional indigenization of Islamic architecture in the archipelago. The mihrab—a niche in the qibla wall indicating the direction of Mecca—features a subtly carved bulus. While mihrabs traditionally serve a spiritual purpose in prayer orientation, their aesthetic dimensions often reflect deeper theological and cosmological meanings. In Masjid Agung Demak, the inclusion of local fauna signifies a harmonious relationship between religion and the environment.



Figure 1 Mihrab Masjid Agung Demak.
(Source: Masjid Agung Demak's Website)

3.1. The Bulus in Javanese Cosmology

The bulus in Javanese belief represents liminality—existing between land and water, embodying patience, adaptability, and cosmological balance. In many Javanese tales, the bulus is a spiritual guardian or an agent of balance, mediating between the forces of nature.

The North Coast of Java, where Demak is located, features the bulus in local folklore tied to the mythology of Raden Patah and Sunan Kalijaga. In these stories, turtles symbolize wisdom, groundedness, and the capacity to navigate multiple realms—a fitting metaphor for spiritual leadership and environmental equilibrium.



Figure 2 Bulus at Mihrab Masjid Agung Demak
(Source: Masjid Agung Demak's Website)

3.2. Integration in Islamic Aesthetics and Mysticism

Islam in Java adopted a nuanced, syncretic form through the dakwah of Wali Songo, who incorporated local symbols to ease the transition from animism and Hindu-Buddhism to Islam. The inclusion of bulus in a religious space does not violate Islamic aniconism because it functions as a symbolic abstraction rather than as an object of worship.

In Sufi traditions, animals often symbolize attributes of the human soul or divine characteristics. The turtle's slowness can be interpreted as sabr (patience), a key virtue in Islamic ethics. The bulus in the mihrab thus becomes a call to spiritual mindfulness and ecological reflection.

The Bulus of Masjid Agung Demak holds deep historical and symbolic importance, particularly within the broader context of Indonesian Islamic architecture. As one of the oldest mosques in the archipelago, established in the 15th century by Raden Patah with the guidance of the Walisongo, it stands as a key monument in the narrative of Java's Islamization. The

mosque served not only as a center for worship but also as a strategic platform for religious and political leadership, signaling the consolidation of the first Islamic kingdom in Java [7]. Its establishment marked a pivotal cultural shift, bridging the transition from Hindu-Buddhist traditions to Islamic spiritual practices in a way that did not erase the past but rather wove it into the evolving religious and cultural fabric of the region.

Architecturally, Masjid Agung Demak reflects a uniquely syncretic approach. The structure's defining feature—the three-tiered pyramidal roof—visually expresses the core Islamic tenets of Iman (faith), Islam (submission), and Ihsan (excellence), while simultaneously echoing pre-Islamic forms familiar to Javanese culture [8]. This design strategy created a visual and spatial continuity that made Islam more accessible and resonant with local communities. Beyond its form, the mosque also incorporates decorative motifs and structural influences from Hindu-Buddhist and even Chinese architectural traditions. These elements are not merely ornamental; they signify a deliberate cultural negotiation, revealing a process of religious assimilation that honored existing aesthetic and cosmological systems. The inclusion of the bulus motif—commonly associated with the turtle or softshell turtle—adds another layer of meaning. In Javanese cosmology, the turtle is often linked with grounding forces, stability, and the aquatic world, symbolizing a deep connection to nature and the cyclical flow of life. Reinterpreted in the mosque's sacred space, it becomes a metaphor for continuity and rootedness amidst spiritual transformation.

Culturally, the mosque functions as a living heritage site, embodying the values and wisdom of the Javanese worldview. Scholars have noted how the spatial layout and symbolic elements of Masjid Agung Demak materialize cosmological principles such as harmony, hierarchy, and balance [9]. These principles are not abstract—they are encoded in the very architecture that continues to host rituals, community gatherings, and spiritual reflections [10]. Despite centuries of change, the mosque remains a central place of worship, highlighting how historical architecture can retain its vitality and relevance when it is integrated into the ongoing rhythms of communal life. It exemplifies how built heritage is not static but dynamic, capable of adapting to time while preserving its core identity.

However, this dynamic quality also presents a set of challenges. As modernization sweeps through urban and rural landscapes alike, historical sites such as Masjid Agung Demak face increasing pressure. Renovations and infrastructure development—if not approached carefully—can erode the authenticity of the site. Replacing traditional materials with modern ones may compromise structural integrity and aesthetic harmony, while commercial tourism risks turning sacred symbols like the bulus into mere decorative curiosities, stripped of their layered cultural and spiritual meanings. Moreover, without adequate cultural literacy, future generations may lose sight of the mosque's symbolic complexity, seeing it only as an old structure rather than a repository of intertwined histories.

In light of these realities, preserving the bulus and the broader heritage of Masjid Agung Demak calls for more than just physical conservation. It demands a culturally sensitive and community-driven approach—one that engages local stakeholders, including religious leaders, historians, and craftspeople, in the stewardship of their heritage. Educational initiatives can help bridge generational gaps, ensuring that younger audiences understand the historical and symbolic richness of the mosque. Policy-wise, there is a need for adaptive heritage frameworks that allow for modernization without sacrificing identity. Ultimately, the story of the bulus is not just about an architectural detail—it is about how tradition, faith, and place intersect to form a living cultural legacy that deserves to be nurtured with care, insight, and respect.

3.3. Sustainability Dimensions of the Bulus Symbol

3.3.1. Ecological Wisdom Embedded in Heritage

The bulus, a species of softshell turtle native to wetlands, rivers, and coastal zones, holds deep ecological and cultural resonance, especially within the vulnerable environmental landscape of Demak. These ecosystems, once abundant and fertile, are now increasingly threatened by rapid land subsidence, mangrove deforestation, coastal erosion, and sea level rise. In this context of ecological fragility, the bulus can be reinterpreted not merely as a decorative motif, but as an ecological sentinel—a symbolic guardian of coastal balance and biodiversity. Its presence in the mihrab of Masjid Agung Demak, the spiritual heart of one of Indonesia's oldest Islamic structures, functions as a profound cultural reminder of the intrinsic link between faith, place, and environmental stewardship [8].



Figure 3 Mihrab Masjid Agung Demak with Bulus inside
(Source: Masjid Agung Demak's Website)

Ecologically, the bulus is considered a bioindicator species, meaning its health and presence directly reflect the condition of its aquatic habitat. Sensitive to pollution, changes in water flow, and habitat degradation, the decline or survival of the bulus can signal the broader well-being of wetland and estuarine ecosystems. When this significance is translated into an architectural context—particularly within the sacred geometry of a mihrab that orients the faithful toward Mecca—the symbolic message becomes layered and powerful. It suggests that just as the mihrab directs spiritual attention, the bulus within it redirects ethical attention to the natural world and its rhythms.

Furthermore, by embedding an aquatic and ecological symbol within a place of prayer, the architecture itself becomes a didactic medium, transmitting environmental values across generations. It prompts communities to revisit their relationship with water, land, and the larger web of life through the lens of tradition and spirituality. The motif of the bulus thus embodies a form of Islamic ecological wisdom rooted in Javanese cosmology, in which harmony with nature is integral to the practice of faith. In light of the accelerating climate crisis, this reinterpretation offers a compelling vision: heritage architecture not as a static relic of the past, but as a living, responsive framework for cultivating environmental consciousness and ethical action in the present.

3.3.2. Regenerative Conservation and Symbolic Reuse

Conventional conservation often views heritage elements as fixed relics—preserved in form but disconnected from the evolving needs of contemporary society. In contrast, this study adopts a regenerative conservation perspective, which sees heritage not merely as something to protect, but as a living system capable of inspiring renewal, resilience, and

relevance across time [11]. Within this framework, architectural elements such as the bulus motif in the mihrab of Masjid Agung Demak are not treated as decorative fossils of the past, but as cultural tools for ecological transformation. Regenerative conservation encourages a dynamic reinterpretation of heritage symbols, breathing new life into them to respond to pressing environmental and social challenges.

Reinterpreting the bulus motif within the context of contemporary climate and coastal crises offers multiple pathways for action and meaning-making. First, it provides a culturally grounded means to promote environmental awareness, particularly among communities that may be more responsive to traditional and spiritual symbols than abstract ecological data [12]. The bulus becomes a bridge between ancestral knowledge and present-day ecological ethics, inviting reflection on the balance between humans and nature—a balance that is deeply embedded in both Javanese cosmology and Islamic principles of *khalifah* (stewardship).

Second, symbolic reuse of the bulus can link architectural education and practice to local ecosystems and sustainability imperatives. In an age where architectural curricula often prioritize global trends over local wisdom, the bulus serves as an example of how place-based symbolism can foster environmentally responsive design. Its integration into architectural pedagogy can cultivate designers who are not only technically skilled but also culturally and ecologically literate.

Third, this approach can reinvigorate community pride and stewardship over their living heritage. Rather than perceiving heritage sites as elite or external domains managed by distant authorities, communities are invited to see their cultural symbols as active components of environmental protection and identity-making. This fosters a participatory model of conservation—one that empowers local actors to care for their heritage not as passive monuments, but as meaningful agents in the collective adaptation to climate change.

This reinterpetative, community-oriented conservation aligns closely with the values and goals of international sustainability agendas. Specifically, it resonates with Sustainable Development Goal 11 (Sustainable Cities and Communities), which emphasizes the protection of cultural and natural heritage in the context of inclusive, safe, and resilient urban environments. It also supports Sustainable Development Goal 13 (Climate Action) by leveraging cultural heritage as a communicative and motivational platform for local environmental engagement and climate resilience.

By activating the bulus as both a symbolic and ecological actor, regenerative conservation bridges the gap between tradition and transformation, showing how heritage can be not just preserved, but evolved into a force for sustainability, community empowerment, and ecological healing.

3.4. Community-Based Conservation in Demak

3.4.1. Demak's Coastal Crisis and Community Response

Demak, a historically significant region on the north coast of Central Java, is now at the frontline of one of Indonesia's most acute environmental crises. Once known for its fertile agricultural land and rich Islamic heritage, Demak is increasingly threatened by chronic coastal flooding (rob), land subsidence, rising sea levels, and ecosystem degradation. Entire villages—such as Timbulsloko and Bedono—have been lost to the sea, displacing residents and dissolving centuries-old community ties. Saltwater intrusion has contaminated agricultural fields and freshwater sources, turning once-productive land into unusable saline zones. The cumulative impact has been ecological destabilization, economic marginalization, and social dislocation, especially for fisherfolk and farmers who rely on the land and sea for their livelihoods.

In response to these existential challenges, local communities, civil society organizations, and academic institutions have mobilized a range of community-based adaptation and

conservation initiatives. Among the most notable are mangrove replanting programs, which aim to restore natural coastal barriers, reduce erosion, and rebuild marine habitats. These efforts not only serve an ecological function but also act as community-building exercises that reconnect people with their environment. Alongside this, floating house prototypes and amphibious architectural solutions have been explored as adaptive housing models that can respond to tidal fluctuations and frequent inundation, reflecting an evolving relationship between architecture and environmental change.

Eco-tourism programs have also been introduced in certain villages, offering educational tours that combine coastal conservation with Islamic heritage storytelling. These programs serve a dual purpose: generating alternative income for residents and raising awareness about environmental risks and cultural resilience. Within this growing ecosystem of grassroots innovation, there exists a unique opportunity to reinvigorate the symbolic presence of the bulus—a traditional motif embedded in the mihrab of Masjid Agung Demak and long associated with resilience, patience, and harmony in Javanese cosmology.

By reintroducing the bulus motif into contemporary community-based conservation efforts—as a visual icon on public signage, eco-tourism materials, floating house ornamentation, or as an educational mascot in coastal restoration projects—local actors can forge a symbolic continuity between past and present. The bulus can serve not only as an emblem of ecological balance but also as a cultural mnemonic, reminding residents that adaptation is not a rupture from tradition but a continuation of it. Embedding this ancestral symbol into climate resilience strategies may deepen community engagement, especially among younger generations who may be disconnected from local oral traditions but are responsive to visual and symbolic cues.

Thus, by linking the bulus with community-based action, Demak can develop a conservation model that is holistic, locally meaningful, and spiritually rooted—a model that affirms that in the face of environmental precarity, cultural heritage is not a passive relic but an active resource for imagining and building sustainable futures.

3.4.2. Participatory Heritage Narratives

Cultural heritage is not static—it flourishes when communities actively engage in its reinterpretation, recontextualization, and revitalization. In this spirit, participatory heritage narratives become a crucial tool for both cultural continuity and sustainable development. Rather than relegating traditional symbols like the bulus to the realm of decorative nostalgia or elite heritage discourse, this approach reclaims and reactivates them through lived experience and collective storytelling.

The bulus, traditionally symbolizing balance, patience, and resilience in Javanese cosmology, is ripe for such reintroduction. Positioned prominently in the mihrab of Masjid Agung Demak, its symbolic significance can be expanded to serve contemporary ecological and educational purposes. Through participatory methods—especially oral histories, storytelling events, and community-based design workshops—local residents can reconnect with the layered meanings of the bulus, interpreting it not only as a cultural emblem but also as a narrative anchor for environmental ethics. These shared narratives, especially when shaped collectively across generations, reinforce a sense of identity and collective memory, crucial for sustaining heritage under the pressures of climate and social change.

In practice, this participatory reinterpretation can take various inclusive forms. Educational workshops involving elders, artisans, religious leaders, and youth can facilitate storytelling sessions where the ecological and spiritual meanings of the bulus are explored and adapted into new formats—murals, crafts, architectural ornaments, or children's books.

These activities not only preserve intangible heritage but also embed sustainability values within cultural frameworks that resonate with the community.

Public exhibitions that link historical narratives of the bulus with present-day coastal challenges—such as mangrove loss or sea-level rise—can serve as visual tools for consciousness-raising. Pairing these exhibits with interactive components (e.g., augmented reality models, oral story recordings, or tactile maps) makes heritage accessible and engaging, particularly for younger generations who may be more digitally oriented.

Moreover, integrating the bulus and its related environmental themes into school curricula—especially in religious and pesantren-based education—can amplify its role as a medium for teaching Islamic environmental ethics, particularly the concept of khalifah (stewardship of the Earth). Lessons that connect Quranic principles with local ecological symbols, such as the bulus and mangroves, can foster a form of faith-based sustainability education, rooted both in scripture and in local cultural wisdom.

This participatory strategy enables a democratization of heritage, shifting the focus from preservation as an institutional task to heritage as a living, evolving dialogue between people, place, and environment. When communities co-author the meanings of their symbols and participate in their adaptation, they are more likely to internalize and uphold the values those symbols represent. In this way, the bulus can become more than a relic of the past; it becomes a narrative vessel for ecological hope, spiritual insight, and sustainable practice in the present and future.

3.5. Comparative Reflections and Broader Implications

The symbolic integration of fauna and flora into sacred architecture is not an isolated phenomenon within Javanese Islamic culture—it is a widespread practice found across the Islamic world, particularly in Southeast Asia, where local cosmologies, indigenous beliefs, and Islamic teachings have long interacted to shape spiritual aesthetics and built environments. The reinterpretation of the bulus in the mihrab of Masjid Agung Demak, therefore, opens the door for comparative reflections that can deepen our understanding of biocultural symbolism within Islamic architecture, and more importantly, offer culturally grounded tools for sustainability and conservation.

In other parts of Southeast Asia, similar symbolic motifs appear in mosque ornamentation, tomb reliefs, and architectural detailing. For example, in Malay coastal communities, the hornbill and catfish have appeared as symbolic animals associated with wisdom, fertility, or spiritual guidance. In Aceh, representations of trees, especially the pohon hayat or Tree of Life, appear in gravestones and mosque decoration, often linked to Qur'anic imagery of paradise and divine order. In the southern Philippines and parts of Borneo, fish and serpentine motifs are sometimes found on mosque doors or minbar panels, reflecting ancestral animist beliefs that have been absorbed and Islamized over time. These examples illustrate that sacred architecture often serves as a canvas for ecological storytelling, where animals and plants become metaphors for divine presence, moral values, and environmental ethics.

By systematically comparing such elements, scholars and practitioners can begin to construct a regional lexicon of biocultural symbols in Islamic architecture. This research presents a reinterpretation of the Lawang Bledheg ornamentation found in the Great Mosque of Demak, Central Java, Indonesia [6]. The study explores the profound connections between architectural ornamentation and the message conveyed in the referenced Quranic verses through an interdisciplinary approach combining aesthetic and symbolic analysis. By conducting on-site observations, examining historical records, and analyzing Islamic artistic conventions, the research unveils the symbolic meanings embedded within the Lawang Bledheg ornaments. The findings demonstrate that the ornaments represent a fusion of local

Javanese artistic traditions and Islamic influences, creating a unique cultural synthesis. The research also highlights the symbolism of unity, tolerance, and religious harmony depicted through the motifs, patterns, and decorative elements of the Lawang Bledheg ornament. These symbols resonate with the themes present in Surah Ali Imran verses 133-136, emphasizing the inclusive nature of the Great Mosque of Demak as a sacred space. By shedding light on the aesthetic and symbolic aspects of the Lawang Bledheg ornamentation, this research contributes to a deeper understanding of the mosque's cultural significance, encourages interfaith dialogue, and inspires contemporary architectural designs. The findings enrich art history, architecture, and religious studies, offering valuable insights into the intricate relationship between art, spirituality, and cultural heritage [13]. This lexicon not only serves academic purposes but also informs design practices that are ecologically sensitive and culturally embedded. For instance, rather than applying generic “green design” features to mosques or Islamic spaces, architects can draw on this lexicon to embed eco-theological narratives—using locally resonant symbols like the bulus, fish, tree, or bird—to embody messages of environmental balance, humility, and divine interconnectedness. Such symbols act not only as visual motifs but also as didactic tools that convey moral and spiritual responsibilities toward nature [14].

Furthermore, these insights can guide the development of eco-theological design guidelines, where architectural decisions—ranging from site orientation, material use, ornamentation, spatial layout, to water management—are inspired by both Islamic teachings and local ecological knowledge systems. In this way, sustainability is not imported as an external concept but emerges organically from within the community’s spiritual and cultural framework.



Figure 4 Bulus and Coastal Sustainability

Lastly, these comparative efforts offer the potential to build regional networks of sustainability practice anchored in shared religious values and cultural identities. As the climate crisis affects multiple Muslim-majority regions in Southeast Asia—many of them coastal and ecologically vulnerable—the cultivation of inter-community dialogues centered on heritage, ecology, and faith can strengthen both academic collaboration and grassroots resilience. Initiatives such as inter-island workshops, digital archives of biocultural symbols, or

collaborative heritage-led adaptation projects can help bridge communities across Java, Sumatra, Kalimantan, the Malay Peninsula, and beyond [13].

In essence, reinterpreting the bulus within Masjid Agung Demak is not only about preserving a singular symbol; it becomes a gateway to broader cultural and ecological conversations, illuminating how Islamic sacred spaces across the region can serve as platforms for environmental consciousness, spiritual renewal, and sustainable living in an age of crisis.

4. Conclusions

The bulus motif in the mihrab of Masjid Agung Demak exemplifies the potential of heritage elements to inform contemporary sustainability and community-based conservation. Far from being an obsolete symbol, the bulus embodies a living philosophy of balance, patience, and environmental stewardship.

By bridging cultural symbolism, architectural sustainability, and grassroots action, we can reclaim the spiritual and ecological dimensions of heritage architecture. This approach fosters a regenerative heritage paradigm—one that is not only about preserving the past, but about cultivating a sustainable future.

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