Blue Papers 2026 (Vol. 5 No. 1), pp. 164–75
10.58981/bluepapers.2026.1.15
Received 25.10.2024; Received in revised form 12.12.2024; Accepted 04.11.2025

Drowning Heritage: The Impact of Climate Change and Erosion on Azizakpe's Water Culture

Rhoda Osei-Nkwantabisa & Martin Larbi

Abstract
Islands have built their culture and heritage around bodies of water. However, due to climate change, the coastal islands are steadily disappearing because of severe flooding and erosion, as in the case of Azizakpe, a fishing community whose history and culture are strongly connected to water. Human activities, including the dredging of the estuary, along with sea level rise exacerbated by global climate change are the primary drivers for this loss. Although various coastal management and adaptation measures have been introduced, their outcomes remain uncertain. This study examines the Azizakpe community and the rapidly deteriorating state of the island. It highlights the effect on local livelihoods and how the community is attempting to cope with the situation and safeguard their water-based heritage, which will be at risk if islanders are displaced.

Policy Recommendations

- Implement eco-engineered shoreline protection in erosion hotspots and support locally tested flood-resilient housing.
- Restore mangroves through regulated replanting, establish community-enforced protection zones, and reduce pressure via alternative energy solutions.
- Strengthen freshwater access through rainwater harvesting systems and pilot solar desalination to address salinization risks.
- Preserve water-related knowledge through a community-led archive, intergenerational education, and partnerships.
- Integrate Azizakpe into national climate frameworks, mobilize climate and heritage funding, and support community-led adaptation.

KEYWORDS

erosion
flooding
habitable islands
heritage preservation
coastal management

WATER ICONS

CLIMATE

Aw: Tropical savanna climate

< Fig. 1 Fallen palm trees on Azizakpe Island in Ghana as a result of severe erosion (Source: Hannahkasak, 2023. CC BY-SA 4.0, via Wikimedia Commons).

Introduction

Small island communities across the globe are increasingly threatened by climate change, sea level rise and human-induced environmental transformations. In Ghana, these challenges are particularly acute for island settlements along the Volta River and the Gulf of Guinea, where erosion, flooding and ecological disruptions are undermining livelihoods and endangering cultural heritage. Azizakpe, a fishing community in the Ada East District, exemplifies this precarious reality. Historically sustained by its estuarine location and distinctive water-based practices – including fishing, crab trapping, boatbuilding and coconut oil production – the community faces the prospect of disappearance as its land area steadily diminishes.

The plight of Azizakpe is not unique, but it has been largely overlooked in scholarship and policy. Existing research on the Volta Basin has focused primarily on the economic and environmental implications of large-scale infrastructure such as the Akosombo Dam (Alhassan 2009; Chambers 1970; Miescher 2021), or on broader assessments of coastal vulnerability in West Africa. Far less attention has been paid to the localized, community-level impacts of erosion and flooding on small islands whose cultural heritage and water-dependent ways of life are deeply tied to place. This gap is critical, as the disappearance of such communities entails not only the loss of physical settlements, but also the erosion of intangible heritage, ecological knowledge and social identity.

This paper addresses that gap by examining Azizakpe as a case study of cultural resilience and ecological vulnerability. It explores the community's historical relationship with the Volta River, its livelihoods and traditions rooted in water and the challenges posed by climate change, erosion and infrastructural interventions. It demonstrates how environmental pressures threaten both tangible and intangible water heritage and argues for more inclusive and research-informed strategies to preserve and adapt vulnerable island communities. Although it focuses on Azizakpe, the article contributes to broader debates on climate adaptation, heritage preservation and sustainable development in small island contexts. The article asks what aspects of Azizakpe's water-based heritage can realistically be preserved in the face of accelerating erosion and sea level rise.

Community's Water Heritage and Relationship with the Volta River

The relationship between Azizakpe and the Volta River is multidimensional, encompassing material survival, settlement patterns, cultural practices and moral worldviews. Water in this context is not merely a physical resource but the foundation of the community's identity and continuity.

A key community strategy has always been material and spatial adaptation. For centuries, the Volta River has provided Azizakpe with fertile land, abundant fisheries (fig. 2) and a reliable transport route. Its estuarine setting allowed the community to thrive through farming, fishing and trade, shaping both its economy and spatial form. Families initially settled near the estuary to benefit from fertile soils and plentiful fish stocks, but as flooding and erosion intensified, settlement patterns shifted. Houses were increasingly built with protective features, such as higher plinths and adaptive layouts, to withstand the river's fluctuations. These adaptations demonstrate how survival has depended

^ Fig. 2 Fishing activities on Azizakpe (Source: Rhoda Osei-Nkwantabisa, 2022).

^ Fig. 3 Crab trapping practices on Azizakpe (Source: Rhoda Osei-Nkwantabisa, 2022).

on intimate knowledge of the river's rhythms, with the landscape itself becoming an archive of the community's responses to environmental change.

Another strategy lies in ritual and festival practices that sustain cultural resilience. Beyond its material functions, the Volta River is a central axis of cultural life. For the Adangme people, water symbolized both survival and protection in times of conflict. The river's natural barriers enabled them to withstand invasions and establish the Ada Kingdom (Sanza 2019). This historical memory continues to be celebrated in rituals tied to water. Returning warriors were once welcomed with purification rites which involved washing their feet in the river and firing muskets across its surface (Tsofanye 2016; Sanza 2019). These practices became institutionalized in the Asafotufiam Festival, one of the most important cultural events for the Ada people. During the festival, participants gather at Kpomkpo-Panya, the riverside point of departure and return for warriors, to perform foot-washing rituals and symbolic water-fetching ceremonies where priests carry water in a mysterious basket without spilling a drop. Such practices reaffirm the river as both a spiritual force and a guardian of the people, embodying their resilience across generations.

Water also permeates Azizakpe's moral and regulatory frameworks. Proverbs tied to the river articulate lessons about social conduct and the natural order. For example, the saying "The river that does not flow in the right direction will never find peace" links the integrity of a river's flow to the importance of ethical behavior, underscoring the belief that human society should mirror natural harmony. In addition, cultural laws and taboos regulate the community's use of water resources. Fishing is forbidden on Tuesdays, a practice that serves both spiritual and ecological functions, allowing fish populations to regenerate. Similarly, restrictions on women crossing the river during menstruation, while controversial today, highlight how cultural codes once governed interactions with water. Together, these practices show that the Volta is not only a natural feature but also a social institution that enforces order, sustainability and respect.

Finally, strategies of continuity and change shape how the community negotiates modernization. In contemporary times, modernization,

^ Fig. 4 The Asafotufiam Festival (Source: Gold Coast XP, 2023).

migration and exposure to globalized culture have reshaped aspects of life in Azizakpe. Younger generations, in particular, often view rituals, proverbs and taboos as symbolic rather than binding, raising concerns about the long-term preservation of intangible water heritage. Yet many traditions - such as the Asafotufiam Festival or proverbs about the river - remain vibrant, passed down through oral storytelling and community gatherings . What is changing, however, is the balance between cultural resilience and physical vulnerability. The same river that embodies identity and spirituality is also eroding the very land on which this culture is practiced. The erosion of cultural practices is thus inseparable from the erosion of physical space, with each amplifying the other.

This intertwined vulnerability suggests that Azizakpe's heritage cannot be reduced to "minor details." The rituals, settlement patterns, proverbs and taboos represent an entire worldview in which water is central to survival, morality and meaning. As the island continues to shrink, what is at stake is not just a fishing community, but a unique cultural system that has developed over centuries of living with and adapting to water.

Challenges Endangering Community's Water Heritage

Small island communities are particularly vulnerable to the impacts of climate change (Scheyvens and Momsen 2008). Their protection should be prioritized, with measures taken to strengthen resilience and mitigate risk. Yet because of their economic vulnerabilities many such communities have not received the attention or help. Water levels are steadily increasing and have been predicted to rise an estimated 5 m by the year 2150 (European Environmental Agency 2024). The changes in water levels will impact many different but related systems of island life including agriculture, fisheries and infrastructure.

Azizakpe's elevation is relatively low, with the highest point being only a few meters above sea level. The village is situated near the riverbank, which is prone to erosion and flooding during heavy rainfall and river surges. Azizakpe lies in a region where the Volta River flows into the Gulf of Guinea, placing it in a deltaic zone where both fresh water and salt-water interact. According to the Intergovernmental Panel on Climate Change (IPCC), global sea levels are expected to rise by 0.3–1.1 m m by 2100 (IPCC 2021). The Gulf of Guinea region is expected to experience higher rates of sea level rise due to local oceanographic factors, such as thermal expansion and glacial melt. Based on regional studies, the coastal areas of Ghana, including the Volta River region where Azizakpe is located, are expected to experience rising sea levels of around 0.5–1 m by the end of the century. In coastal areas like Azizakpe, small rises in sea level (even as little as 0.3 m) can result in significant flooding. Regional studies of Ghana's coast, including the Volta estuary, show that sea level rise and associated saltwater intrusion are already degrading fresh

^ Fig. 5 Erosion control with car tires (Source: Rhoda Osei-Nkwantabisa, 2022).

water resources and threatening agriculture and drinking water supplies (Nyekodzi et al. 2016; Avornyo et al. 2023).

The most immediate challenge is the loss of land and ecosystems. Approximately 20 acres (8.1 ha) of Azizakpe's land, nearly a quarter of the island's total area, have been lost to erosion. This reduction has displaced families, disrupted trading activities and diminished the viability of the settlement. By 2023, only four shops remained active, a stark indicator of the island's economic contraction. Ecologically, erosion has destroyed mangroves, farmland and animal habitats, while aquatic species such as crabs and fish have retreated from degraded waters. The disappearance of land is therefore not only a spatial loss but also an ecological and economic one.

Water and food security are equally threatened. Saltwater intrusion has compounded the crisis, contaminating boreholes and the Volta River, the community's primary drinking water source. What was once an abundant and free supply of fresh water has become unsafe, forcing residents to rely on imported water at high cost. This change has reshaped daily practices of drinking, bathing, and washing, while also threatening cultural rituals such as foot-washing ceremonies tied to the river. Similarly, the salinization of soils has halted farming, eliminating an important supplement to diets and incomes. The resulting food and water insecurity has raised the cost of living and has led to increased emigration from the island.

Livelihoods have been destabilized and disrupted. As a fishing community, Azizakpe has traditionally depended on a diverse set of water-related occupations, including crab hunting, fish mongering, boatbuilding and coconut oil production (fig. 2). Flooding and erosion have severely undermined these livelihoods. The decline of coconut trees has led to reduced oil production, cutting off a major source of household income. Fishing yields have dropped, both because of ecological disruptions and because the physical space for fishing-related activities is shrinking. These cascading effects illustrate how climate change threatens not just one economic sector but the entire interconnected system of livelihoods in Azizakpe.

The cultural consequences of these transformations are profound. The erosion of land and resources also erodes intangible heritage. Rituals, proverbs and taboos tied to the river lose their resonance when the material base, including fresh water, fertile soils and abundant fish, is degraded. For example, the practice of foot-washing in the Volta River is increasingly constrained as access points are lost to flooding and erosion. Thus, environmental changes undermine not only survival but also the cultural expressions that define Azizakpe's identity.

Taken together, these challenges reveal the depth of the community's vulnerability. The threats to land, ecosystems, livelihoods and

^ Fig. 6 Erosion control with sand tubes (Source: Rhoda Osei-Nkwantabisa, 2022).

^ Fig. 7 The Mangrove Restoration Project (Source: Rhoda Osei-Nkwantabisa, 2022).

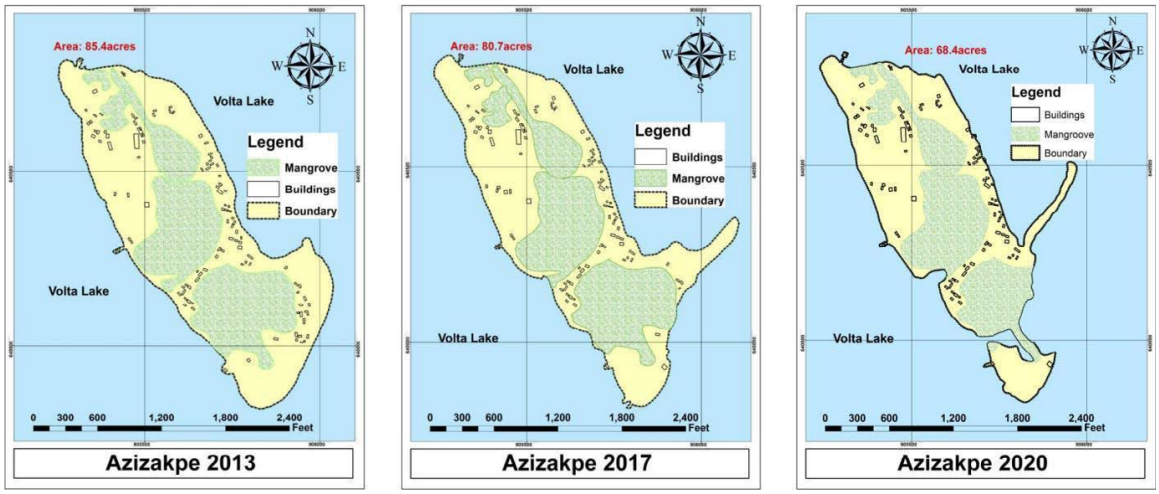
heritage are interlinked, reinforcing each other in ways that compound the risk of total disappearance. What is at stake is not only the survival of a small island settlement but also the preservation of a unique water-based culture.

Adaptation Strategies and Their Shortcomings

In response to the accelerating erosion and flooding, both external actors and the people of Azizakpe have attempted a range of adaptation strategies. These interventions vary in scale from government-led dredging and mangrove restoration to household modifications, but they share a common outcome: limited and temporary effectiveness. Understanding why these measures failed is essential for explaining the community's current vulnerability.

The most significant government intervention was undertaken by the Volta River Authority (VRA). They undertook dredging of the main estuary between 1990 and 2016, primarily to control weed infestation and improve water flow (Nyekodzi et al. 2016; VRA 2022). While this reduced bilharzia and improved navigation, it also altered sediment dynamics. Many residents attribute the acceleration of erosion after 2016 to the abrupt cessation of dredging activities, which left the shoreline destabilized. In the early 2000s, a mangrove restoration project (fig. 7) was jointly launched by the District Assembly, the Forestry Commission, and the Ada Tourism Stakeholders Association. The project aimed to reinforce the shoreline using natural vegetation. However, without enforcement or alternative energy sources, residents continued to harvest mangroves for firewood and construction, gradually undoing the intervention. The project illustrates how ecological restoration efforts fail when livelihood pressures are not addressed.

At the community-scale, Azizakpe residents have long experimented with small-scale protective structures. Since the 1990s, they have installed rock sills perpendicular to the river, constructed sea walls from concrete-filled car tires and deployed sandbags and sand tubes (figs. 5 and 6). These measures were funded collectively by residents and through contributions from local philanthropists. While ingenious, their effectiveness was highly localized: The tire sea wall protected a small section of



^ Fig. 8 The levels of erosion 2013–2020 (Source: Rhoda Osei-Nkwantabisa, 2022. Basemap from ARCGIS © Esri and DeLorme, HERE, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, Tomtom).

shoreline but left the rest exposed, and sandbags disintegrated quickly under wave action.

At the household level, families have sought to adapt their homes to recurrent flooding. Common strategies include raising plinths, elevating houses on stilts, reinforcing foundations with concrete-filled pipes and installing sand-filled planters as protective barriers. These measures provide temporary protection for individual households, especially during the rainy season when the Volta River overflows. Yet they cannot address the broader processes of shoreline retreat and saline intrusion.

The failure of these strategies can be traced to several interrelated factors. Localized and fragmented measures cannot match the scale of estuarine hydrodynamics. Institutional support has been weak, with interventions rarely embedded in broader coastal defense policies or backed by sustained funding. Livelihood pressures – such as the reliance on mangroves for energy and construction – directly conflicted with ecological restoration. Many community-led efforts lacked technical or engineering expertise, leaving them vulnerable to the river's force. Finally, chronic socioeconomic constraints limited the community's capacity to invest in durable solutions or maintain protective structures.

The limited success of these strategies should not be evidence that Azizakpe is unsalvageable. Instead, their failure highlights the structural neglect of small island communities and the inadequacy of fragmented, under-resourced interventions. The erosion of Azizakpe is not an inevitable "natural" outcome but the result of governance gaps and a lack of integrated, research-informed coastal management. Unless such measures are developed, abandonment will continue, but it will be the consequence of institutional failure rather than environmental determinism.

The Community Tomorrow

Over the past decade, Azizakpe has lost roughly a quarter of its landmass (fig. 8), and projections suggest that continued erosion and sea

level rise will make permanent habitation increasingly difficult. The acceleration of land loss since the cessation of dredging activities in 2016 highlights the severity of the threat: If current trends continue, the island may become uninhabitable within a generation. This physical decline has forced the community to confront an uncomfortable reality. Despite their persistent efforts to protect the shoreline through sea walls, mangrove planting and household-level adaptations, most of these measures have been short-lived or ineffective. As a result, many residents now live with a sense of uncertainty, with some preparing psychologically for eventual relocation.

This looming future raises a central question: What does preservation mean in a context where physical land is steadily disappearing? For Azizakpe, preservation cannot be understood solely as holding back the sea. While temporary interventions such as coastal defenses, elevated housing and fresh water management projects can reduce immediate risks and buy valuable time, they cannot reverse the underlying processes of climate change, sea level rise and sediment loss. It is unlikely that the island, in its present physical form, can be secured indefinitely.

At the same time, abandoning the island without a preservation strategy risks erasing an entire cultural world. Azizakpe's heritage is not only material, where it is embodied in boats, traps and houses, but also intangible, embedded in rituals, oral traditions, ecological knowledge and a symbolic relationship with the Volta River. These dimensions of life can, and must, be preserved even if the island itself is eventually lost. For example, the annual rituals of foot-washing in the river, proverbs that encode moral teachings through water imagery, and traditional fishing and boatbuilding skills, represent cultural resources that extend beyond geography. If carefully documented and transmitted, they can survive relocation and continue to inform community identity in new environments.

The future of Azizakpe therefore demands a dual approach. On the one hand, short- to medium-term physical interventions are necessary to sustain life and livelihoods in the immediate horizon. Strengthening flood defenses, experimenting with resilient housing and securing alternative fresh water sources such as rainwater harvesting or small-scale desalination could extend the viability of the island and reduce the trauma of sudden displacement. These measures would not “save" Azizakpe forever, but they would provide time for gradual adaptation rather than abrupt collapse.

On the other hand, the long-term preservation of Azizakpe lies not in defending its territory alone but in safeguarding its heritage. This requires deliberate documentation of oral traditions, ecological knowledge and ritual practices, as well as institutional support for transmitting these elements to younger generations. Here, NGOs, academic researchers and heritage organizations could partner with the community to record and preserve water-based culture in written, audiovisual and educational forms. Schools and cultural associations could serve as vehicles for teaching these traditions, ensuring continuity even in new locations.

Seen in this light, the community tomorrow is not only a story of loss, but also of transformation. While the island itself may eventually disappear beneath the sea, Azizakpe's cultural and historical identity does not have to vanish with it. Instead, it can be carried forward, re-

interpreted and re-rooted elsewhere. The critical challenge is therefore not merely to delay the physical erosion of the island but to create pathways through which its heritage, both material and intangible, can endure in the face of inevitable environmental change.

Conclusion

Azizakpe illustrates the dilemmas facing small island communities under climate change: The scale of erosion and sea level rise makes full physical preservation unlikely, while the erosion of land simultaneously threatens cultural heritage. The key question is not whether Azizakpe can be "saved" in a material sense, but how its heritage can be carried forward in ways that honor its history and sustain its identity.

This requires a dual strategy. First, short- to medium-term measures – such as strengthening coastal defenses, supporting resilient housing and securing fresh water supplies – can prolong habitation and reduce immediate risks. These interventions will not eliminate the threat of disappearance, but they can create space for communities to adapt rather than be forced into abrupt displacement.

Second, and more crucially, proactive documentation and transmission of Azizakpe's water-based culture must be prioritized. Recording rituals such as the foot-washing ceremonies, preserving oral traditions and proverbs tied to the Volta River and supporting the continuation of fishing and boatbuilding knowledge will ensure that Azizakpe's identity survives beyond the land itself. Here, NGOs, heritage organizations and academic institutions can play as central a role as the state.

The preservation of Azizakpe, then, is not about resisting inevitable physical change but about ensuring cultural continuity under displacement. By reframing preservation around heritage rather than territory, the community's survival can be reimagined in ways that are both realistic and meaningful. This approach avoids naive appeals for intervention and instead offers a pragmatic response to the question at the heart of this study: What is it that we aim to preserve, and how can it endure in the face of climate change?

Acknowledgment

This contribution was peer-reviewed. It was edited by members of the editorial team of the UNESCO Chair Water, Ports and Historic Cities: Matteo D'Agostino, Michele Tenzon and Carlien Donkor.

References

Alhassan, Henry Shirazu. 2009. "Viewpoint – Butterflies vs. Hydropower: Reflections on Large Dams in Contemporary Africa." *Water Alternatives* 2 (1): 148–160.

Avornyo, Selasi Yao, Kwasi Appeaning Addo, Pietro Teatini, Philip S. J. Minderhoud, and Marie-Noëlle Woillez. 2023. "Vulnerability of Ghana's Coast to Relative Sea Level Rise: A Scoping Review." *AFD Research Papers* 282. Paris: Agence Française de Développement.

Chambers, Robert, ed. 1970. *The Volta Resettlement Experience*. London: Pall Mall Press.

European Environment Agency. 2024. "Global and European Sea Level Rise." Accessed March 28, 2024. https://www.eea.europa.eu/en/analysis/indicators/global-and-european-sea-level-rise.

Intergovernmental Panel on Climate Change (IPCC). 2021. *Climate Change 2021: The Physical Science Basis*. Cambridge University Press.

Miescher, Stephan F. 2021. "Ghana's Akosombo Dam, Volta Lake Fisheries and Climate Change." *Daedalus* 150 (4): 124–142.

Nyekodzi, Gifty, Elaine T. Lawson, and Christopher Gordon. 2018. "Evaluating the Impacts of Dredging and Saline Water Intrusion on Rural Livelihoods in the Volta Estuary." *International Journal of River Basin Management* 16 (1): 93–105. https://doi.org/10.1080/15715124.2017.1372445.

Scheyvens, Regina, and Janet Momsen. 2008. "Tourism in Small Island States: From Vulnerability to Strengths." *Journal of Sustainable Tourism* 16 (5): 491–510. https://doi.org/10.1080/09669580802159586.

Sanza, Akesse. 2019. "Asafotufiam Festival: Remembering the Soldiers with War Festival." Accessed October 20, 2024. https://jetsanza.com/asafotufiam-festival/.

Tsofanye, Naa Adjeley. 2016. "Asafotufiam." The Ga-Dangme. Accessed October 20, 2024. https://thegadangme.com/asafotufiami/.

Volta River Authority (VRA). 2022. "Non-Power Activities." https://www.vra.com/subsidiaries/non_power_activities.php.

Rhoda Osei-Nkwantabisa is a graduate architect in Ghana. She holds a master's degree in architecture from the Kwame Nkrumah University of Science and Technology. She is currently pursuing another master's degree in City Planning at the Massachusetts Institute of Technology. She has practiced at Atelier SMQ, an architecture firm in Ghana, and writes about resilient communities, sustainable architecture and urban design. She is also an active volunteer of 350 Ghana Reducing our Carbon, which prioritizes spreading awareness about the need for renewable energy use.

Contact: rhodaoseinkwantabisa4@gmail.com & rhoda030@mit.edu

Martin Larbi is a lecturer in the Department of Architecture at the Kwame Nkrumah University of Science and Technology. His research interests lie in sustainable architecture, green transitions, pro-environmental behavior and livable and smart urbanism. He is currently a Postdoctoral Fellow at the ARC Training Centre for Advanced Building Systems against Airborne Infection Transmission (THRIVE) at Queensland University of Technology, Australia. He was awarded his PhD in Architecture and Urban Design in 2019 at the School of Architecture and Built Environment, University of Adelaide, South Australia. Martin is a scholar of the Australian Housing and Urban Research Institute (AHURI) and a Green Star Accredited Professional of the Green Building Council of Australia for Design and As-Built rating.

Contact: mklarbi.18@gmail.com