An Exploratory Study of Coastal Management Challenges in Eko Atlantic City and Ajah Coastal Communities, Lagos State, Nigeria

[1]ORELAJA Olabode Phillips; [2]ALE Adegoke & [3]AKINOLA Omobolanle

[1, 2 & 3]Department of Urban and Regional Planning, University of Lagos
Corresponding Author's Email: oorelaja@unilag.edu.ng

Abstract

This study examines coastal management practices in Eko Atlantic City and selected coastal communities in Ajah. It also interrogates the sociocultural and environmental characteristics, challenges, and resilience of coastal communities in Lagos State. The study employs a qualitative research design to investigate Coastal Zone Management (CZM) practices in the study areas. Semi-structured interviews were conducted with key informants and stakeholders, including kings, chiefs, community leaders, youth associations, fishermen, and other prominent persons. The interviews explored in-depth perspectives and insights on CZM practices in Eko Atlantic City and the Ajah (Okun, Mopo Akinlade, Mopo Onibeju) communities, as well as the challenges associated with CZM implementation. Stakeholder engagement and governance were organised through focus group discussions. A purposive sampling technique was used. After the recordings were transcribed, thematic analysis was used to identify key themes relevant to the study objectives. Findings revealed that challenges in managing the coastal area include inadequate funding and discrimination against artisanal fishers and small-scale coastal traders operating outside the formal sector. While Eko Atlantic City has received government intervention, there is no mitigation practice in place to combat flooding, erosion, and other disasters in the Ajah communities. Policy alignment, inclusiveness, adaptive measures, and alternative livelihood sources for residents were recommended for coastal communities.

Keywords: Adaptive measures, coastal communities, inclusiveness, integrated coastal management and resilience.

Introduction

The management of coastal areas cannot be overemphasised, as they are among the most productive and valued ecosystems in the world (Ramesh *et al*., 2015; Martínez *et al*., 2007). For this reason, estimates indicate that half of the world's population (3 billion) lives within 200 km of the coastline (Hinrichsen, 2013). This figure is projected to double by the year 2025 (Hinrichsen, 2013). The reasons for rapid population growth in the coastal area include economic, industrial, tourism, fishing and aquaculture, shipping, mining and energy production, and exploitation of coastal and marine resources, e.g. mangroves (Andrews *et al*., 2021). These have attracted more people, with about 60 per cent of the world's population today living in coastal areas (Barragán & Andrés, 2015). Nonetheless, human pressures on the coastal region and its resources have made them one of the most degraded and threatened ecosystems (Crain *et al*., 2009). Lagos State is situated along Nigeria's coastline and is the most populous state, with over 20 million people living in the region (Lukeman *et al*., 2014). More importantly, Lagos's diverse economy generates around 20% of Nigeria's GDP, fuelled by public and private investment (Abdullahi, 2018). The Western region coastal area is rich in biodiversity and resources, covering 28,454 km^2 (Thompson & Arowosafe, 2020).

However, over the last few decades, inadequate management has caused severe environmental degradation, loss of aquatic biodiversity, habitat destruction, and shoreline and coastal pollution within the region. In addition, given current projections of global climate change and sea-level rise, the Lagos coastal region is under threat. Despite the ecological and economic importance of coastal areas and growing concerns over environmental degradation, shoreline erosion, biodiversity loss, and pollution in Lagos coastal regions, there remains limited empirical evidence on the effectiveness of Integrated Coastal Zone Management (ICZM) in addressing these challenges within specific coastal settings in Lagos State.

Existing studies have largely focused on environmental conditions, economic significance, and the vulnerability of coastal ecosystems, with less attention to the management practices adopted, their effectiveness, and the challenges affecting their implementation in rapidly developing coastal areas such as Eko Atlantic City and the Ajah communities. Consequently, there is insufficient understanding of how Integrated Coastal Zone Management can be applied to mitigate marine ecosystem degradation and enhance sustainable coastal resource management in these areas. This knowledge gap necessitates a focused investigation of coastal challenges and management practices within the study area. Therefore, this study investigates Integrated Coastal Zone Management and its role in preventing the degradation of marine ecosystems in Lagos. However, the study focuses on Eko Atlantic City and the communities in Ajah, with a view to examining coastal challenges and management practices in these areas.

Scope of the Study

The study focuses on Eko Atlantic City and selected coastal communities in Ajah, including Okun Ajah, Mopo Akinlade, and Mopo Onibeju, within Lagos State.

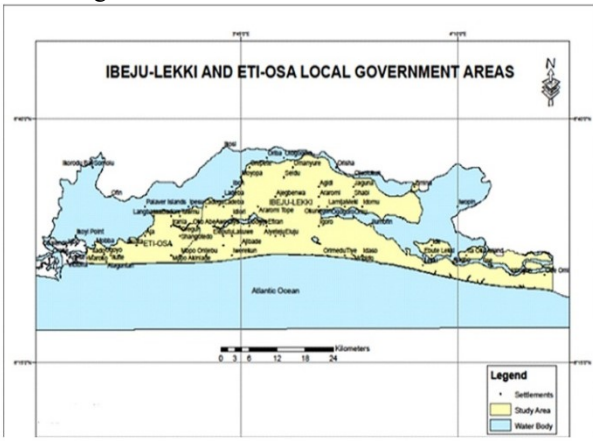


Figure 1: Vulnerable Areas to Flooding in Eti-Osa Local Government Area
Source: Lekki Comprehensive Masterplan Report (2024).

Eko Atlantic City is located on Victoria Island, under the Eti-Osa Local Government Area in Lagos State, which is officially Nigeria's International Commerce City, also known as Eko Atlantic City, or the initials E.A.C. and E. A (Titilayo, 2023). It is a planned city of Lagos State, Nigeria, being constructed along the coast on land reclaimed from the Atlantic Ocean. The Great Wall of Lagos was constructed to protect the shoreline of Victoria Island and the early phases of Lekki from coastal erosion.

Ajah lies on the eastern side of Lagos, within the Lekki area of Eti-Osa LGA, with Victoria Garden City (VGC) to its left and Epe to its right. Ajah was founded about 350 years ago by the Ogunsemo and Ojupon families in Lagos State (Sanni, 2021). It is one of Lagos's fastest-growing areas. It was once largely grassland with trees and water until Chevron began major development there. Ajah has been inhabited for centuries, dating back to the arrival of the Portuguese and the beginning of the slave trade in 1704 (Sanni, 2021), when Lagos was transformed from a fishing village into a city. In the past, the residents of Ajah were fishermen and hunters (Ogunsola, 2018).

The communities selected and visited are Okun Ajah, Mopo Akinlade and Mopo Onibeju along the coastline in the Eti-Osa Local Government of Lagos State. The residents were formerly engaged in farming and fishing, but this has changed due to recent economic shifts.

Literature Review

Coastal zones are dynamic and complex environments that serve as hubs of economic activities, cultural heritage, and ecological significance. Effective management of these areas is essential to balance competing interests and ensure sustainable development.

Principles of Integrated Coastal Zone Management

Integrated Coastal Zone Management (ICZM) is a holistic approach that aims to balance social, economic, and environmental considerations in coastal areas (Kies et al., 2020). Key principles include stakeholder participation, adaptive management, ecosystem-based approaches, and sustainable development (Schultz, 2011). The principle recognises the interconnectedness of coastal processes, ecosystems, and human activities (European Commission, 2002) and emphasises integrating environmental, social, and economic considerations into decision-making (Gardner, 1989; Ascough et al., 2008). Stakeholders' participation fosters collaboration, builds trust, and enhances the legitimacy of decision-making processes (MacDonald *et al*., 2022). It ensures that management strategies are inclusive, responsive to local needs, and culturally sensitive (Page *et al*., 2022). Adaptive management is another key principle that recognises the dynamic nature of coastal systems and the inherent uncertainties associated with environmental change (Allen *et al*., 2011). Adaptive management involves iterative processes of monitoring, evaluation, and adjustment in response to new information and changing conditions (European Commission, 2002). By incorporating feedback loops and learning mechanisms, ICZM enhances resilience and promotes adaptive capacity in coastal communities (Ken, 2020; Sanò, 2009). It is important to note that the value of coastal ecosystems lies in fostering human-nature interactions and promoting long-term sustainability (Fleming *et al*., 2019). ICZM also seeks to balance socio-economic development with environmental conservation, ensuring that economic growth is socially inclusive, environmentally responsible, and economically viable (van Dijk et al., 2016; Healy & Wang, 2004). By integrating environmental protection, social equity, and economic prosperity, ICZM promotes resilient and thriving coastal communities (Sandhu *et al*., 2019; Albotoush & Shau-Hwai, 2019).

Challenges in Coastal Management

Coastal zones face numerous challenges, including erosion, pollution, habitat loss, and climate change impacts (Fernandino et al., 2018). Urbanisation and land reclamation exacerbate these challenges, increasing the vulnerability of coastal communities (Bisaro, 2019). Coastal erosion, driven by wave action, storms, and sea-level rise, threatens the stability of shorelines and infrastructure (Griggs &

Reguero, 2021). Eroding coastlines exacerbate property damage, habitat loss, and community displacement, posing significant socio-economic challenges (Ali *et al*., 2020). In addition, pollution from industrial discharges, sewage, and solid waste contaminates coastal waters, degrading water quality and threatening marine ecosystems (Bashir *et al*., 2020). Marine debris, including plastics, poses risks to marine life, human health, and coastal aesthetics, necessitating concerted efforts for waste management and pollution control (Harding, 2016).

Coastal habitats, such as mangroves, coral reefs, and salt marshes, are under threat from habitat destruction, overexploitation, and land-use changes (Nicholas *et al*., 2019; Gibson *et al*., 2007). Loss of critical habitats diminishes biodiversity, reduces resilience to climate change, and compromises ecosystem services (Oliver *et al*., 2015). Rising sea levels inundate low-lying coastal areas, exacerbate erosion, and amplify flood risks, necessitating adaptive measures for coastal resilience (Griggs & Reguero, 2021). Rapid urbanisation and coastal development exacerbate pressure on coastal resources and ecosystems (Celliers et al., 2015; Li *et al*., 2016). Unplanned development leads to habitat loss, increased pollution, and fragmentation of coastal landscapes, undermining the ecological integrity and resilience of coastal areas (Wu et al., 2022; Zabbey *et al*., 2019). Integrated land-use planning and coastal zoning regulations are necessary to balance development needs with environmental conservation objectives (Allmendinger et al., 2002; Pourebrahim *et al*., 2011). It is worth noting that effective coastal management requires coordinated action among stakeholders, including government agencies, local communities, NGOs, and private-sector actors (Ibrahim, 2013; Văidianu *et al*., 2020). However, institutional fragmentation, conflicting mandates, and limited capacity often hinder integrated approaches to coastal governance (Van Assche *et al*., 2020).

ICZM Practices in Eko Atlantic City

Eko Atlantic City, a reclaimed land development in Lagos State, presents a unique case for coastal management. Coastal engineering plays a critical role in protecting Eko Atlantic City from erosion and storm surge events. The city's Great Wall of Lagos, a massive sea defence barrier, serves as a primary coastal protection measure, shielding the city from the impacts of rising sea levels and extreme weather events (Ajayi *et al*., 2017). It incorporates innovative urban design and engineering solutions to address coastal vulnerabilities, including sea-level rise and coastal erosion (Mariano *et al*., 2021). The city's master plan integrates green infrastructure, coastal defences, and sustainable drainage systems to enhance resilience and mitigate flood risks (Oyedotun & Nnaji, 2018). However, questions have been raised about the long-term sustainability and ecological impacts of such mega-projects. Despite a focus on urban development, Eko Atlantic City incorporates elements of environmental conservation and biodiversity preservation, with efforts to restore and enhance coastal habitats, including mangroves and wetlands, to support biodiversity and ecosystem services (Idowu & Home, 2017). The city also adopts climate-resilient urban development practices to reduce vulnerability to coastal hazards.

Community-Based Approaches in Ajah Communities

Ajah Communities, situated along the Lagos coastline, exemplify the importance of community involvement in coastal management. Local initiatives focus on mangrove conservation, waste management, and sustainable fisheries to address environmental degradation and improve livelihoods (Okeke *et al*., 2017). Community-based initiatives in Ajah Communities focus on mangrove conservation and restoration, including tree-planting campaigns, habitat rehabilitation, and awareness-raising activities (Adegbile *et al*., 2019). The Ajah communities discovered that coastal pollution poses significant threats to marine ecosystems and human health. They proposed a community-led waste management initiative to address pollution hotspots, promote recycling and waste-reduction practices, and raise awareness of the importance of clean beaches and waterways (Okeke *et al*., 2017). However, in traditional knowledge and cultural practices, fishing is the primary livelihood activity for many residents, providing food security and economic opportunities. Therefore, community-based fisheries management emphasises sustainable fishing practices, resource conservation, and co-management arrangements between fishers and local authorities.

Stakeholders' Engagement and Governance Structures

Effective ICZM requires collaboration among various stakeholders, including government agencies, local communities, NGOs, and private sector actors (McGowan, 2011). Multi-level governance structures facilitate coordination and decision-making in coastal management (Rocle *et al*., 2021). However, challenges related to institutional fragmentation and conflicting interests often impede effective governance.

Methodology

This study employed a qualitative research design to examine the challenges faced by coastal communities in Eko Atlantic City and Okun-Ajah in implementing Integrated Coastal Zone

Management (ICZM) practices. A purposive sampling technique was used to select 34 participants based on their involvement in coastal governance and community development. The participants comprised 2 Baales, 6 chiefs, 12 community leaders, 6 youth association representatives, 4 fishermen, and 4 key stakeholders involved in coastal-related economic activities, including 2 beach tourism investors. Data were collected through semi-structured interviews lasting 25-30 minutes. The interviews explored participants' perceptions of ICZM practices, governance structures, stakeholder participation, and coastal management challenges. All interviews were audio-recorded with participants' consent and supported by field notes. In addition, three Focus Group Discussions (FGDs) were conducted to gather broader stakeholder perspectives on ICZM implementation and governance. Data collection continued until thematic saturation was achieved. Interview and FGD transcripts were transcribed verbatim and analysed using thematic analysis to identify key themes and patterns relating to ICZM practices, governance challenges, and community experiences in the study area.

Findings

The findings in this study are sectionalised into Eko Atlantic City and other coastal communities, which are the focus of this study.

Eko Atlantic City

Eko Atlantic City occupies approximately 10 million square metres of land reclaimed from the Atlantic Ocean. This structure is being built to curb coastal erosion along the Lagos-Atlantic coast and is still under construction (see Figure 2-4). The Eko Atlantic project is a high-end development backed financially by private bodies, the Lagos State Government, and the Federal Government. It is a well-planned city that, according to findings, will improve the state's economy when completed.



Figure 2: Aerial View of Eko Atlantic City

Source: www.ekoatlantic.com/eko-atlantic-secures-first-ifc-sdge-certification/



Figure 3: Interlocked Street in Eko Atlantic City
Source: Field Survey, 2023



Figure 4: Canal in Eko Atlantic City
Source: Field Survey, 2023

One key challenge associated with the development is social exclusion, as it appears to cater mainly to wealthy residents and investors while excluding informal-sector groups. This will keep the social gap between the rich and the poor wide.

The Great Wall of Lagos

The Great Wall of Lagos was built to protect Victoria Island and the early phases of Lekki from coastal erosion and flooding caused by Atlantic Ocean waves (see Figure 5). The Great Wall of Lagos is a large sea revetment that protects the emerging city and Victoria Island from flooding caused by ocean surges. The Wall was designed by Royal Haskoning Marine Engineers from Holland, world-renowned for their over 100 years of experience in urban planning and development. In their design process, Royal Haskoning took into account the Atlantic's harsh conditions and designed a wall to protect the city efficiently. At the end of this design process, Royal Haskoning took this design to the Danish Hydraulic Institute and built a full-scale model of the wall in Eko Atlantic City. The sea wall was subjected to the worst waves predicted in a 1,000-year cycle. The finished sea wall model withstood the tests without showing any signs of distress. It is made of solid rocks called Accropodes and a membrane, which is 60% water and 40% sand that prevents water and sand from colliding (Van-Bentum *et al*., 2012).



Figure 5: Accropode Armour Units Used for the Great Wall of Lagos
Source: Field Survey, 2023.

Okun Ajah

This community is situated along the Lekki Peninsula, near the Ajah Roundabout, and is known for its serene beaches and waterfront views. The community was originally home to farmers and fishermen, but today the coastline along Okun Ajah has been eroded and faces several challenges (see Figure 6). In recent times, the former community for farmers and fishers has become home to various other vocations, such as tailors, vulcanisers, panel beaters, and engineers.

During the visit to the community, we interviewed stakeholders and identified decision-makers. Some residents believed that the water body is associated with a deity that requires appeasement. However, it is believed that the water deity's anger caused the flood in the study area due to the constant dirt being thrown into it, which the deity dislikes. Further investigation revealed a belief that water has healing powers to cure ailments such as measles. Although seawater is generally saline, some residents reported being accustomed to drinking it and not perceiving it as salty.



Figure 6: Eroded shoreline in Okun Ajah
Source: Field Survey, 2023 and 2026

The challenges in this community stem from the absence of mitigation measures to combat flooding, erosion and other disasters. This lack has been a leading cause of the ongoing flooding and erosion affecting the community. However, traditional beliefs have shaped residents' responses to these flooding challenges, with the belief that appeasing the water deity would reduce damage, even as shorelines continue to erode and buildings by the shore keep collapsing. It was reported that "damage was more during the wet season", when "waves grow stronger" and destroy properties. Another belief reported by residents was that flooding occurs because the ocean does not mix with rainwater.

Mopo-Akinlade

This community is situated near Mopo Onibeju and Ogombo, close to Sangotedo and Lekki Phase II, with geographical coordinates of 6°26′0″N and 3°37′0″E, at an elevation of 7 metres (see Figure 7). The community shoreline has been severely eroded (see Figure 8).

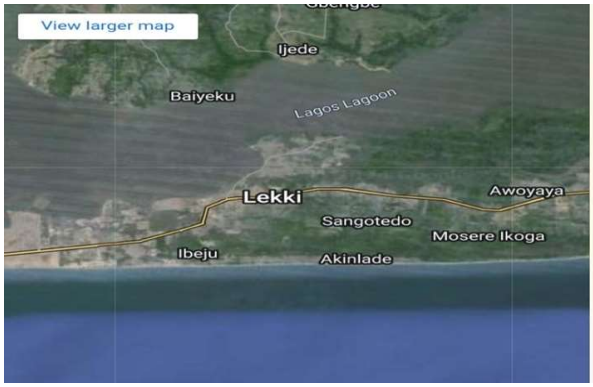


Figure 7: Map of Mopo Akinlade
Source: Google Earth, extracted 2023



Figure 8: Eroded Shoreline at Mopo Akinlade
Source: Field Survey, 2023



Figure 9: *Ojo-Olokun shrine, Mopo Akinlade*
Source: Field Survey, 2023

The study found that the community had stopped fishing and taken up other vocations due to ocean-related damage. The community believed they were protected by the deity "Oju-Olokun" (see Figure 9), and monthly cleansing and sacrifices were performed to appease the deity and reduce flooding. They faced unemployment because they had stopped fishing and lacked mitigation measures to address flooding, erosion, and other disasters. They had the traditional belief that deities were responsible for the erosion and flooding in the community. Funding the mitigation of flooding in the study area is a major challenge, as neither government agencies nor other organisations are present to support mitigation efforts.

Mopo-Onibeju

The community is situated near Mopo Akinlade and Ogombo, close to Sangotedo and Lekki Phase II, and its geographical coordinates are 6°25'35" N, 3°37'08" E, at an elevation of 5 metres.



Figure 10: Eroded Shoreline at Mopo Onibeju
Source: Field Survey, 2023



Figure 11: Abandoned Canoe at Mopo Onibeju
Source: Field Survey, 2023

The study found that the community faced high unemployment because the fishing occupation had been eroded by the natural disaster (see Figures 10 and 11). Residents reported inadequate fishing equipment and the loss of shoreline areas due to coastal erosion. The community also faced an electricity supply shortage and held beliefs in their water deity. A similar belief was reported in Mopo Akinlade. The study found that no mitigation practices were in place to prevent flooding and erosion, resulting in continuous flooding in the area. Residents also reported that there was no assistance from the government, and the local government authority had neglected the community. Consequently, the community lacked government-supported mitigation funding.

It was established earlier that there were no government agencies or other organisations in the coastal communities. However, the people in the community are requesting that, if they are provided with fishing equipment, it would ease navigation in

the community. Collaboration with local canoe builders could help improve fishing activities in the community.

Discussion of Findings

The study's analysis reveals a stark contrast between the realities of coastal protection at Eko Atlantic City and the vulnerabilities facing the Ajah community, highlighting distinct socio-environmental and economic issues that shape the lived experiences of both locations within the broader context of Lagos' coastal management.

Eko Atlantic City demonstrates a high level of infrastructural sophistication in flood mitigation, with advanced seawalls, drainage, and elevation. This contrasts with the Ajah community, which remains highly exposed due to insufficient drainage, low elevation, and a lack of coastal protection systems. The implications are not only physical but also socio-economic, as recurring floods in Ajah disrupt livelihoods, damage property, and impede movement, contributing to a cycle of vulnerability. Effective waste management in Eko Atlantic City underscores the value of well-funded urban planning. By contrast, Ajah suffers from poor waste disposal, with indiscriminate dumping into drains and water bodies exacerbating flooding and water pollution. The presence of solid waste in Ajah's stormwater channels reinforces the interrelationship between environmental hygiene and infrastructural inadequacy. This situation highlights the systemic neglect of peripheral communities in urban environmental governance.

The disparity in housing quality further underlines socio-economic inequality. While Eko Atlantic's buildings comply with strict regulations and are designed to withstand extreme weather, Ajah's housing landscape is largely informal, lacking proper building codes and often constructed with substandard materials. This leaves residents disproportionately affected during heavy rains and tidal surges. The proliferation of unregulated development in Ajah reflects weak enforcement of urban planning laws and the limited capacity of government agencies to monitor peripheral expansion. The livelihoods in Ajah are predominantly tied to informal sectors such as fishing, petty trading, and transport services—sectors highly susceptible to environmental disruptions. Coastal erosion and flooding have a direct negative impact on these income streams. In contrast, Eko Atlantic City is designed for commercial elites, offering high-end economic opportunities that are insulated from environmental shocks. This divide underscores the disproportionate socio-economic impacts of climate change and poor coastal management on vulnerable populations.

Community awareness and participation in environmental decision-making were found to be critically low in Ajah. Residents have limited knowledge of coastal protection strategies and often view environmental management as a governmental responsibility. By contrast, the corporate structure of Eko Atlantic ensures coordinated management and planned development, though it is largely exclusive and top-down. The absence of inclusive governance in Ajah weakens resilience and hinders the implementation of community-based solutions to climate risks.

The divergent institutional responses reflect broader governance challenges. While Eko Atlantic benefits from private-sector investment and policy prioritisation, Ajah appears neglected by public agencies and suffers from fragmented, reactive policy interventions. This disparity reveals a need for integrated coastal zone management policies that bridge the divide between high-end developments and informal coastal settlements. A critical takeaway is that sustainable coastal management must be inclusive, equitable, and context-sensitive to address the multi-dimensional risks faced by all communities.

Conclusion

The study found that these communities were vulnerable to the adverse effects of coastal hazards, including the loss of homes, livelihoods, and vital infrastructure. The development of Eko Atlantic City presents both opportunities and challenges for coastal management and urban resilience. It is important to prioritise sustainable urban development principles, inclusive governance mechanisms, and stakeholder engagement strategies to ensure the city evolves into a model of resilience and sustainability in the face of climate change and coastal challenges. The investigation into the coastal communities of Okun-Ajah, Mopo Akinlade, and Mopo Onijebu, as well as the burgeoning urban centre of Eko Atlantic City, revealed several opportunities for collaboration and identified ways for stakeholders to enhance ICZM. Addressing the complex challenges faced by coastal communities requires resolute efforts from governments, civil society organisations, private-sector actors, and residents. By fostering collaboration, sharing knowledge and resources, and implementing innovative solutions, it is easier to build more resilient and sustainable coastal communities that thrive in harmony with their natural environment.

Recommendations

Overall, collaboration among stakeholders in coastal communities in Lagos State is essential for addressing complex challenges, promoting sustainable development, and improving the resilience of these vulnerable areas to

environmental and socio-economic pressures. The following areas require attention:

- Partnership with environmental organisations and government agencies could foster opportunities in the community by empowering the people, educating the youth, and raising awareness about environmental conservation. It is important to inform the residents about climate change adaptation and disaster preparedness. Partnering with institutions for training and skills development programs will empower residents to build sustainable livelihoods. In the area of economic development, collaboration with appropriate organisations will promote ecotourism and sustainable fishing practices while preserving natural resources. This opportunity could lead to the value-added processing of seafood products, increasing income for fishermen and women in the community.
- The community also needs to collaborate with government agencies and other organisations for infrastructural development, including the improvement of roads and drainage systems, to enhance resilience to the impacts of climate change. There is also a need to have coastal protection barriers and flood-resistant buildings to enhance resilience to climate-related hazards.
- Infrastructure improvement is key in this area for resilience purposes to mitigate the impacts of climate change along the coastline. It is necessary to mitigate the impacts of natural disasters by collaborating with the appropriate agencies and through public-private partnerships. There is a need to empower and educate the youth in the community through different programmes. Community leaders need to engage with the appropriate government agencies and participate in decision-making processes to ensure that residents' needs and concerns are addressed, especially in development projects.
- There is a need to ensure environmental conservation and protection by cleaning up the coastline to address pollution, promote marine conservation, and restore mangroves to mitigate the impact of erosion.

References

Abdullahi, S.I. (2018). Nigerian economy: business, governance and investment in a period of crisis. *Governance and Investment in Period of Crisis*.

Adegbile, O. M., Alabi, O. A., & Adesina, A. A. (2019). Community Participation in Mangrove Conservation and Management in Coastal Areas of Lagos State, Nigeria. *Journal of Environment and Earth Science*, 9(11), 35–45.

Ajayi, O. O., Adegbile, M. O., & Akinjare, O. A. (2017). Integrated Coastal Zone Management (ICZM) in Eko Atlantic City, Lagos, Nigeria: An Overview. *Journal of Environment and Earth Science*, 7(5), 1–10.

Albotoush, R., & Shau-Hwai, A. T. (2019). Evaluating integrated coastal zone management efforts in Penang, Malaysia. *Ocean and coastal management*, *181*, 104899.

Ali, I., Shaik, R., Maruthi, A. Y., Azman, A., Singh, P., Bala, J. D., & Hossain, K. (2020). Impacts of climate change on coastal communities. In Ahmed K. (2020) Decision Support Methods for Assessing Flood Risk and Vulnerability, *IGI Global*, 42–59. ISBN 9781522597711.

Allen, C. R., Fontaine, J. J., Pope, K. L., & Garmestani, A. S. (2011). Adaptive management for a turbulent future. *Journal of Environmental Management*, *92*(5), 1339–1345.

Allmendinger, P., Barker, A., & Stead, S. (2002). Delivering integrated coastal-zone management through land-use planning. *Planning Practice and Research*, *17*(2), 175–196.

Andrews, N., Bennett, N. J., Le Billon, P., Green, S. J., Cisneros-Montemayor, A. M., Amongin, S., Gray, N. J., & Sumaila, U. R. (2021). Oil, fisheries and coastal communities: A review of impacts on the environment, livelihoods, space and governance. *Energy Research & Social Science, 75*, Article 102009. https://doi.org/10.1016/j.erss.2021.102009

Ascough, I J. C., Maier, H. R., Ravalico, J. K., & Strudley, M. W. (2008). Future research challenges for incorporation of uncertainty in environmental and ecological decision-making. *Ecological modelling*, *219*(3-4), 383–399.

Barragán, J.M., & De Andrés, M. (2015). Analysis and trends of the world's coastal cities and agglomerations. *Ocean and Coastal Management*, 114, 11–20.

Bashir, I., Lone, F. A., Bhat, R. A., Mir, S. A., Dar, Z. A., & Dar, S. A. (2020). Concerns and threats of contamination on aquatic ecosystems. In R. Khalid & A. Raouf (Eds.), *Bioremediation and biotechnology: Sustainable approaches to pollution degradation* (pp. 1–26). Springer.

Bisaro, A. (2019). Coastal Adaptation through Urban Land Reclamation: Exploring the Distributional Effects. *Journal of the*

Geographical Society of Berlin, *150*(3), 131–144.

Celliers, L., & Ntombela, C. (2015). Urbanisation, coastal development and vulnerability, and catchments. In *UNEP-Nairobi Convention and WIOMSA. 2015. The Regional State of the Coast Report: Western Indian Ocean. UNEP and WIOMSA, Nairobi* (pp. 387–406).

Fernandino, G., Elliff, C. I., & Silva, I. R. (2018). Ecosystem-based Management of Coastal Zones in face of Climate Change Impacts: Challenges and Inequalities. *Journal of Environmental Management*, *215*, 32–39.

Fleming, L. E., Maycock, B., White, M. P., & Depledge, M. H. (2019). Fostering Human Health through Ocean Sustainability in the 21st Century. *People and Nature*, *1*(3), 276–283.

Gardner, J. E. (1989). Decision making for Sustainable Development: Selected Approaches to Environmental Assessment and Management. *Environmental Impact Assessment Review*, *9*(4), 337–366.

Gibson, R., Atkinson, R., & Gordon, J. (2007). Loss, Status and Trends for Coastal Marine Habitats of Europe. *Oceanography and Marine Biology: An Annual Review*, *45*, 345–405.

Griggs, G., & Reguero, B. G. (2021). Coastal Adaptation to Climate Change and Sea-level Rise. *Water*, *13*(16), 2151.

Harding, S. (2016). Marine Debris: Understanding, Preventing and Mitigating the Significant Adverse Impacts on Marine and Coastal Biodiversity. Technical Series No.83. *Secretariat of the Convention on Biological Diversity, Montreal*, 78.

Healy, T., & Wang, Y. (2004). Integrated Coastal Zone Management for Sustainable Development—With Comment on ICZM Applicability to Muddy Coasts. *Journal of Coastal Research*, 229–242.

Kem, L. (2000). The Evolution of Coastal Management in Sri Lanka. Retrieved from https://www.crc.uri.edu/download/Chap_4-Sri_LankaCY.pdf on July 17, 2024.

Hinrichsen, D. (2013). *Coastal waters of the world: Trends, threats, and strategies*. Island Press. Retrieved from https://www.crc.uri.edu/download/HIN_0024.pdf on July 17, 2024.

Ibrahim, H. S. (2013). Towards an Effective Framework for Coastal Zone Management: The Egyptian Experience. *Journal of Coastal Conservation*, *17*, 601–613.

Idowu, T. E., & Home, P. (2015). Probable effects of Sea Level Rise and Land Reclamation Activities on Coastlines and Wetlands, in *Proceedings of the 10th JKUAT Scientific, Technological and Industrialization Conference and Exhibition* (pp. 207–220).

Kies, F., Monge-Ganuzas, M., De Los Rids-Escalante, P. R., Elegbede, I. O., & Courselli, C. (2020). Integrated Coastal Zone Management (ICZM) Framework and Ecosystem Approach: Eutrophication Phenomenon at the Mediterranean Sea. *Bulletin de la Société Royale des Sciences de Liège,* 89, 55–73.

Li, Y., Zhang, X., Zhao, X., Ma, S., Cao, H., & Cao, J. (2016). Assessing spatial vulnerability from rapid urbanization to inform coastal urban regional planning. *Ocean and Coastal Management*, *123*, 53–65.

Lukeman, Y., Bako, A.I., Omole, F.K., Nwokoro, I.I.C., & Akinbogun, S.O. (2014). Socio-economic attributes of residents of slum and shanty areas of Lagos State, Nigeria. *Mediterranean Journal of Social Sciences*, *5*(9), 656–662.

MacDonald, A., Clarke, A., & Huang, L. (2022). Multi-stakeholder partnerships for sustainability: Designing decision-making processes for partnership capacity. In *Business and the ethical implications of technology* (pp. 103–120). Cham: Springer Nature Switzerland.

Mariano, C., Marino, M., Pisacane, G., & Sannino, G. (2021). Sea level rise and coastal impacts: Innovation and improvement of the local urban plan for a climate-proof adaptation strategy. *Sustainability*, *13*(3), 1565.

Martínez, M.L., Intralawan, A., Vázquez, G., Pérez-Maqueo, O., Sutton, P. & Landgrave, R. (2007). The coasts of our world: Ecological, economic and social importance. *Ecological Economics*, *63*(2-3), 254–272.

Masalu, D.C. (2000). Coastal and Marine Resource Use Conflicts and Sustainable Development in Tanzania. *Ocean and Coastal Management*, *43*(6), 475–494.

McGowan, L. (2011). *'Practice and prospects for integrated coastal zone management (ICZM) in the UK: improving non-statutory coastal governance through collaboration'* (Doctoral dissertation, University of Liverpool).

McLean, R. F., Tsyban, A., Burkett, V., Codignotto, J. O., Forbes, D. L., Mimura, N., ... and Ittekkot, V. (2001). Coastal zones and marine ecosystems. *Climate change*, 343–379.

Nichols, C. R., Zinnert, J., & Young, D. R. (2019). Degradation of coastal ecosystems: causes, impacts and mitigation efforts. *Tomorrow's*

Coasts: Complex and Impermanent, 119–136.

Ogunsola, A. (2018). Comparative studies of the socio-economic characteristics of marine and lagoon artisanal Fisherfolks in Lagos State, Nigeria. International Journal of Fisheries and Aquatic Studies 2018; 6(5): 37–43.

Okeke, O. J., Adebayo, A. B., & Akpan, A. A. (2017). Coastal Management Practices in Ajah Communities of Lagos State, Nigeria. *Journal of Coastal Research*, 83(sp1),

Oliver, T. H., Isaac, N. J., August, T. A., Woodcock, B. A., Roy, D. B., & Bullock, J. M. (2015). Declining resilience of ecosystem functions under biodiversity loss. *Nature Communications*, *6*(1), 10122.

Oyedotun, T. D. T., & Nnaji, C. O. (2018). Eko Atlantic City, Lagos, Nigeria: An Emerging Coastal Megacity in Africa – Engineering, Socio-Economic and Environmental Perspectives. *Journal of Coastal Research*, 85(sp1), 90–97.

Page, A., Mavropoulou, S., & Harrington, I. (2022). Culturally responsive inclusive education: The value of the local context. *International Journal of Disability, Development and Education*, *69*(4), 1313–1326.

Pourebrahim, S., Hadipour, M., & Mokhtar, M. B. (2011). Integration of spatial suitability analysis for land use planning in coastal areas: case of Kuala Langat District, Selangor, Malaysia. *Landscape and Urban Planning*, *101*(1), 84–97.

Ramesh, R., Chen, Z., Cummins, V., Day, J., D'elia, C., Dennison, B., Forbes, D.L., Glaeser, B., Glaser, M., Glavovic, B., & Kremer, H. (2015). Land–ocean interactions in the Coastal Zone: Past, present and future. *Anthropocene*, *12*, pp.85–98.

Rocle, N., Dachary-Bernard, J., & Rey-Valette, H. (2021). Moving towards multi-level governance of coastal managed retreat: Insights and Prospects from France. *Ocean and Coastal Management*, *213*, 105892.

Sandhu, S. C., Kelkar, V., & Sankaran, V. (2019). *Resilient coastal cities for enhancing tourism economy: Integrated Planning Approaches* (No. 1043). ADBI Working Paper Series.

Sanni, H. A. (2021). Migration in the Eti-Osa Area of Lagos State since the 17th century. *Addaiyan Journal of Arts, Humanities and Social Sciences*, 3(7): 17–31. ISSN: 2581–8783.

Sanò, M. (2009). *A Systems Approach to Identify Indicators for Integrated Coastal Zone Management.* A Doctoral Thesis, Department of Water Science and Technology of the Civil Engineering School of the Universidad de Cantabria.

Schultz, L., Duit, A. & Folke, C. (2011). Participation, adaptive co-management, and management performance in the World Network of Biosphere Reserves. *World Development,* 39(4), 662–671.

Thompson, O. A. & Arowosafe, F. C. (2020). Developing a Public-Private Partnerships Model for Sustainable Management of Ecotourism Sites in Nigeria. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development* 20(4), ISSN 2284-7995, E-ISSN 2285-3952.

Titilayo, J. A. (2023). *Enclave Urbanism and Infrastructure Outcomes: The Eko Atlantic City and Urban Sustainability Issues in Lagos*. Doctoral Thesis submitted to the Design and Urban Department, Graduate College, KRITTIS Technical University of Darmstadt.

Văidianu, N., Tătui, F., Ristea, M., & Stănică, A. (2020). Managing Coastal Protection through Multi-Scale Governance Structures in Romania. *Marine Policy*, *112*, 103567.

Van Assche, K., Hornidge, A. K., Schlüter, A., & Vaidianu, N. (2020). Governance and the coastal condition: Towards new modes of observation, adaptation and integration. *Marine Policy*, *112*, 103413.

Van Dijk, J., Broersma, L., & Mehnen, N. (2016). Options for Socioeconomic Developments in ICZM for the Tri-national Wadden Area. *Ocean and Coastal Management*, *119*, 76–92.

Van-Bentum, K. M., Hoyng, C. W., Van-Ledden, M., Luijendijk, A. & Stive, M. (2012). The Lagos Coast-Investigation of the Long-Term Morphological Impact of the Eko Atlantic City Project. In *Crossing Borders in Coastal Research: Jubilee Conference Proceedings*. Retrieved from https://www.academia.edu/80857121/The_Lagos_coast_Investigation_of_the_long_term_morphological_impact_of_the_Eko_Atlantic_City_project?uc-sb-sw=57965051

Wu, W., Zhi, C., Gao, Y., Chen, C., Chen, Z., Su, H., … & Tian, B. (2022). Increasing Fragmentation and Squeezing of Coastal Wetlands: Status, Drivers, and Sustainable Protection from the Perspective of Remote Sensing. *Science of the Total Environment*, *811*, 152339.

Zabbey, N., Giadom, F. D., & Babatunde, B. B. (2019). Nigerian Coastal Environments. In *World Seas: An Environmental Evaluation* (pp. 835–854). Academic Press.