Coastal erosion, sand and gravel mining, and open defecation threaten the sustainability and outstanding universal value (OUV) of heritage monuments dotted along the coast of Ghana. A sea defence project has been embarked upon in some areas in Ghana to, among other reasons, safeguard coastal resources, including the historic heritage monuments—castles and forts. This study examined the implications of the project for the sustainability and OUV of a UNESCO World Heritage Site (WHS) along the Ghanaian coastline. The study used a qualitative research design. In-depth interviews and focus group discussions were conducted to collect data from key stakeholders and analyzed using the thematic method. It became evident that the project has helped reduce oceanic effects, sand and gravel mining hazards, and open defecation in the direct neighbourhood of the site. These have increased the resilience and protective capacity of the monument and enhanced the aesthetic value and sanitation at the site, thereby shoring up the integrity and authenticity of the site and culminating in its enhanced sustainability and OUV. UNESCO, the State Party, Ghana Museums and Monuments Board, Municipal Authority, and Community Leaders should ensure that the advantages that have accrued to the site from the sea defence project are safeguarded and maximized. Additionally, the project should be extended to other coastal areas in the country where similar monuments are located to enable those monuments to derive similar benefits for sustainable development. The study contributes to understanding the protective and aesthetic nexus between coastal engineering and sustainable coastal heritage management.

1. Introduction

Coastal zones, the narrow transition areas that connect terrestrial and marine environments, constitute arguably the planet’s most productive and valued ecosystems[1]. Over 50% of the world’s major cities are located in coastal zones, and over 40% of the global population live within 200 km of a coastal zone [2]. As these zones have long been favourably disposed to human settlement, they have a wealth of archaeological and heritage information that can help analyse and understand human history and evolution to guide the present and future generations for sustainable development. The English Channel and the North Sea, for instance, had landscapes that once connected the British Isles to mainland Europe; this land bridge finally submerged thousands of years ago [3–5]. In addition, Doggerland (now beneath the southern North Sea) had potential insightful prehistoric information to guide human development, but anthropogenic [6] and oceanic activities have tended to destroy such useful information [3, 7, 8]. These show that coastal historical assets and archaeological sites have traces of past human existence that offer tremendous potential for human guidance and, therefore, need to be preserved and protected for sustainable development (SD) [6].

Among the most valuable coastal heritage properties are the historical castles and forts. These heritage monuments are repositories of evidence of human activity over millennia for their contribution to landscape character, sense of place, and community identity and as assets for leisure and tourism purposes [9, 10]. The historic coastal monuments are unique and need to be protected because once they are damaged or destroyed, their benefits and relevance for SD may be lost to both the present and future generations. Globally, many coastal heritage monuments face threats from the hazards of
the sea [11]. Reimann et al. [12] found that UNESCO World Heritage Sites (WHS) located in coastal areas were increasingly at risk due to hazards resulting from coastal erosion and other anthropogenic activities such as sand mining and quarrying.

Most coastlines are naturally dynamic, and cycles of erosion are often an important feature of their ecological character [13]. Natural and anthropogenic factors conspire to exacerbate erosion in many coastal places. The natural factors include winds, waves, tides, and currents that move the unconsolidated sand and soil in the coastal area, resulting in a landward displacement of the shoreline [14, 15]. Anthropogenic activities that contribute to coastal erosion include land reclamation, port development, settlements, gravel, and sand mining. These factors and poor sanitation practices, particularly open defecation at the coasts, threaten the sustainability, integrity, and aesthetic appeal of the coastal heritage monuments and their environments [16, 17], especially in developing countries.

Many governments of coastal countries embark on sea defence projects along their coasts to, among other reasons, protect and salvage important resources, including heritage monuments. A coastal defence or sea defence is a form of wall constructed where the sea and its associated coastal processes impact directly upon the landforms of the coast [18, 19]. Sea defence walls are built to protect areas of human habitation, conservation, and leisure activities from the actions of the ocean [20, 21]. English Heritage [22] has argued that amongst the range of coastal assets, archaeological and historical remains are particularly vulnerable to coastal erosion, as many of these are situated in the intertidal or subtidal zones.

The coastline of Ghana is dotted with many heritage assets—historical castles and forts—that are of immense significance for tourism and heritage studies. However, coastal erosion is projected to catch up with these important heritage properties. Many of the heritage legacies are at vulnerable edges of precipices, a few being in the process of collapsing into the sea [23]. Besides the sea effects, coastal sand mining, quarrying, and unhealthy sanitary practices that take place at the coast are a threat to the sustainability and outstanding universal value (OUV) of the properties some of which are listed as UNESCO World Heritage Sites (WHS). While sustainability implies longevity, OUV refers to cultural and/or natural significance that is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity [24–26]. OUV is one of the central ideas underpinning the World Heritage Convention. For a heritage property to be deemed of OUV, it should be exceptional, or superlative from a global perspective [27, 28]. The management of WHS requires the identification and assessment of risks that threaten the sustainability and OUV of the heritage asset [29].

Sea defence projects have been carried out by the government of Ghana on the Ghanaian coastal areas considered to be highly vulnerable to oceanic and anthropogenic activities. The defence projects include the Keta Sea Defence Project, Ada Sea Defence Project, Sakumono Sea Defence Project, the New Takoradi Sea Defence Project, and Komenda, Elmina, and Cape Coast Sea Defence Projects. The site-specific implications of these interventions need to be explored, so the good effects can be maximized and the unfavourable implications dealt with in the interest of promoting the OUV and sustainability of the monuments for tourism and sustainable development. However, no study appears to have been conducted to find out the implications of the sea defence projects for the integrity and authenticity of the castles and for that matter the sustainability and OUV of these world heritage buildings.

The objective of this study was to explore the implications of the sea defence project for Elmina Castle as a UNESCO WH site. This site was selected because apart from being listed as a UNESCO WH site, it is a monumental heritage edifice that epitomizes the precolonial and colonial history of Ghana and Africa [23]. Its uniqueness stems from the fact that it was the first castle built by the Europeans in sub-Saharan Africa for trade in slaves and precious minerals [15]. The findings of the study would provide insights into the implications of coastal defence for coastal heritage sites for professionals, practitioners, researchers, and technocrats in coastal defence and heritage management. The evidence-based recommendations could be applied to other heritage buildings in similar coastal environments in developing countries to ensure that such engineering works remain sympathetic to the sustainability and OUV of the iconic coastal heritage properties.

2. Study Area and Methods

2.1. Study Site. Elmina Castle (Figure 1) was the study site. The castle is listed as a UNESCO World Heritage site. Also known as St George castle, the Elmina Castle is located in the Central Region of Ghana. The castle was built by the Portuguese in 1482. It was the first permanent structure south of the Sahara built by the Europeans. The castle served as an outpost for the Portuguese to trade their goods for slaves, many thousands being kept in the dark, damp dungeons. It was also heavily guarded against attacks by other European empires that were keen on gaining its strategic position. The Dutch captured the castle in the mid-1600s after previous unsuccessful attempts. Other nations that fought to control it included the English. The castle was originally a trading post for the country’s gold, ivory, and timber. This later developed into the infamous slave triangle transporting human cargo to America and the Caribbean, raw materials such as cotton and rubber to Britain, and manufactured goods such as clothing and weaponry back to the West Coast of Africa. Currently, most local and international tourists to Ghana visit the Elmina Castle because of its history as a major trans-Atlantic slave hub. The dungeons are a poignant reminder of those dark times (http://www.pbs.org/wonders/Episodes/Epi3/elmina.htmDeletehttps://gmb.gov.:http://www.pbs.org).

2.2. Methods. A qualitative case study approach was adopted. The rationale was to gain an in-depth understanding of the issues at stake through the use of open-ended
questions that would enable the participants to freely disclose their experiences, thoughts, and feelings about the issues. Qualitative methods offer a dynamic research approach, as they afford the researcher the opportunity to follow up on answers given by respondents [30]. It also helps to generate a valuable conversation around the topic or subject and bring out key issues to be addressed.

Data were gathered from three main sources—coastal and heritage management documents; observation; as well as interviews and discussion with respondents. Based on Vileikis et al’s [28] advice on stakeholder participation in cultural heritage conservation and management, the primary data component was collected from various stakeholders using interviews and focus group discussions. Data were collected from Ghana Museums and Monuments Board Site Managers at the castles, Tourists, a Museums and Monuments Expert, Community Leaders, Community Youth, a Municipal Authority Official, and a Sea Defence Engineer. It targeted those who were familiar with the study site before and after the construction of the sea defence so they could compare the situations in the two time periods—before and after the sea defence project. Only two tourists who were familiar with the study site were interviewed because all other tourists who were approached at the site during the data collection period indicated they were not familiar with the heritage environment before the sea defence started. A focus group discussion guide (FGD) was used for FGDS with the community youth, while interview guides were used for the rest of the participants. The items in the instruments were designed mainly around issues of sanitation, coastal erosion, aesthetics, and tourism as they related to the integrity and authenticity towards the sustainability and OUV of the heritage property. Most of the items were similar across the instruments for the various categories of respondents so the responses could be compared at the analysis and report writing stages. Apart from the tourists who were accidentally selected, appointments were booked with the rest of the participants. The use of the IDIs and FGDS, coupled with the heterogeneous purposeful selection of the respondents, allowed for triangulation of data and information.

Data collection took place in July and August 2021 by the researcher and two assistants, each with a master’s degree. The literate respondents signed informed consent to indicate their voluntary participation in the study, while the non-literate ones thumb-printed for the same purpose after the purpose of the study had been explained to them in languages they understood. Additionally, the respondents were assured of anonymity and confidentiality. Attention was paid to commonly used words, tone of voice, facial expressions, and body language as means of understanding the perspectives of the effects of the sea defence project on the heritage assets. Permission was obtained from the respondents before the commencement of each interview or

**Figure 1:** Map of the study site. Source: Geographic information system, department of geography and regional planning, University of Cape Coast, Ghana.
discussion. Observation of the physical environment was done with a checklist, and photographs taken of important features and scenes. Data saturation occurred after collecting data from a total of 38 participants whose profile is provided in the results section of this article. The interviews and discussions were audio-recorded with the permission of the participants; where permission was not granted, detailed notes were taken.

Guba’s [31] approach to ensuring the trustworthiness of qualitative research was followed. This refers to (a) credibility, which is the equivalent of internal validity in quantitative research; (b) transferability (known in quantitative research as external validity/generalisability); (c) dependability (referred to in quantitative research as reliability); and (d) confirmability (known in quantitative research as objectivity). To ensure these, source and method triangulations were done [15]. In terms of source triangulation, individual viewpoints and experiences were verified against others, which ultimately helped get a rich picture of the issues under consideration. Method triangulation involved the use of different instruments (IDI and FGDs) containing similar items, and a wide range of informants [30]. Checks relating to the accuracy of the data were done on the spot, in the course, and at the end, of the data collection exercises. After the fieldwork, the interviews and discussions were transcribed verbatim and stored securely with a password. The researcher and research assistants went back to the respondents to read the transcripts to some of the participants for them to check whether the transcribed data accurately captured their reports. Some corrections and clarifications were made by the respondents that were factored into the final transcripts.

The data were read through several times and analyzed manually using the open coding system to identify key themes and sub-themes. Saturation of data analysis occurred when no other themes and sub-themes were emerging from further analysis. Overarching themes concerning the effects of the construction of the sea defence were discussed as subheadings in the findings section of this article. At each stage, the researcher and the research assistants discussed issues that were not clear until a compromise was reached before proceeding to the next stage. Using the thick narrative approach supported with quotes of significance from the participants, the presentation of the results and discussions was done within the context of the literature on sea erosion, sanitation, tourism, aesthetics, and fortification of coastal heritage monuments.

3. Results and Discussions

The results and discussions are presented under the following subheadings: profile of respondents, Elmina Castle and the sea defence project, sanitation, aesthetics, sand and gravel mining, heritage tourism, and other reports.

3.1. Profile of the Respondents. In all, 38 participants made up of eight categories of respondents (participants) were involved in the study. Of them, 58% were males, and 42% were females. The profile of the categories of the respondent is provided in Table 1.

3.2. Elmina Castle and the Sea Defence Project. Built in 1482 by the Portuguese, Elmina Castle is arguably the oldest European trading structure in sub-Saharan Africa. The castle wields a great influence on not only Ghana’s history but also that of the world over four centuries as the focus of the gold and slave trade. It is a significant and emotive symbol of European-African encounters and the starting point of the African Diaspora. The Elmina Castle with the sea defence wall under construction is presented in Figure 2. The Elmina Sea Defence Project is part of phase III of the emergency sea protection project in Ghana, being constructed by Vuluxx Company Limited, with the Hydrological Services Department as the consultants. The project involves a combination of revetment and groynes using boulders. The construction work is a form of marine craft, using cranes with suspended access systems and divers working in tidal conditions.

3.3. Protection of the Castle from Sea Effects. One of the most important ways of ensuring that coastal heritage properties serve the present and future generations is to protect the integrity and authenticity of these properties. However, despite all the discussion of rising seas and coastal erosion, there has been little discussion of the threats posed to the archaeological and historical sites located along the coastlines of the world. It is acknowledged that if left unchecked, the rising seas and accelerated erosion will destroy many of the world’s most important coastal heritage sites, thus eroding important human history [32]. The respondents’ perspectives on the protection implications of the sea defence project for the coastal heritage asset are epitomized by their reports as follows:

The sea defence has enhanced the protection of the castle; the sea waves and tides were wreaking serious havoc on the historic monument, which, but for the sea defence intervention, would have been worse (community leader, male).

The ocean was gradually washing away the castle. The sea defence project has saved the colonial legacy from the unfavourable erosion effects of the Atlantic Ocean (youth, male).

The ocean waves used to take a toll on the castle. The sea defence project has come to save it from the ravages of the tidal inundations (youth, female).

The Municipal Assembly is grateful to the Government of Ghana for this project. Apart from protecting the castle from the hazards of sea erosion, it also makes the place more attractive to visitors (municipal authority official, male).

Although the castles and forts in Ghana, including the Elmina Castle, are protected under the National Liberation Council Decree (NLCD) 387 of 1969 and Executive Instrument (EI) 29 of 1973 and many other legislations, these are mere paperwork and therefore need to be supported with actual actions for effective protection. The legislations are necessary, but in Ghana, they do not work as the laws are often flouted with impunity. The sea defence project is a
practical way of protecting the coastal heritage. It has actually enhanced the monument’s resilience to the vicissitudes of the Atlantic Ocean. Waves are now kept at bay. This is real protection, not mere paperwork (GMMB site manager).

All properties inscribed on the World Heritage List must have adequate protection mechanisms in place. The protection management approaches may vary from one country to another, but whatever form it takes, it must be effective. The coastal defence project is one of the effective measures the government of Ghana has taken to protect the castles from coastal erosion. This is significant as it will ensure the longevity of the property (tour guide, male).

The sea defence project supports UNESCO’s plan to protect and conserve the castle as a WHS. Articles 4 and 5 of the 1972 Convention, enjoins States Parties to ensure the protection and conservation of heritage properties. It further makes it incumbent on State Parties to adopt policies that aim to integrate the protection of cultural heritage into comprehensive planning programmes. The sea defence helps actualize this function, and it shows the Government of Ghana’s and the GMMB’s preparedness to support UNESCO’s efforts at protecting WHS for sustainable development (heritage expert, male).

According to the engineer, the project has improved the condition of the Elmina Castle as it has stabilized the otherwise vulnerable conditions of the property. The engineer added that by acting as a seawater deflector, the sea wall has lessened the impact of wave run-up during stormy sea conditions, thereby, protecting the castle against tidal inundations, which previously befell the heritage property.

Clearly, the views of all the categories of respondents show that the construction of the sea defence wall augured well for the protection of the castles from coastal erosion. This was in line with UNESCO’s protection and conservation management plans concerning WHS. Appearing in the UNESCO Courier that increasing threats from coastal erosion was one of the factors that influenced the relocation of the office and residence of Ghana’s President from the Christiansborg Castle at Osu in Accra to the Flagstaff House in Accra in 2013. Other national landmarks in Ghana, including the Independence Square and the Kwame Nkrumah Mausoleum in Accra, and UNESCO World Heritage sites in the coastal areas of the Volta, Greater Accra, and Central and Western Regions of Ghana, which were the remains of fortified trading posts erected between 1482 and 1786, were in danger of being claimed by the encroaching sea in the next century. Similarly, other coastal heritage sites in Ghana such as Fort Kongensten—a historic Danish Fort constructed at Ada in 1783—had been washed away, while parts of Fort Prinsensten, built at Keta in 1734, had been destroyed by coastal erosion.

These findings suggest that considering sustainability as measured in terms of protection of the castles for future generations, and OUV as in increased integrity of the properties, the sea defence project is worthwhile. This is important because once the sustainability is compromised and the OUV of a WHS is destroyed, the World Heritage Committee can remove the property from the World Heritage List. Removing it from the list also means the benefits associated with such sites will be reduced or lost to the local community and the country in which the property is located, as well as the global community. The protection effect of the seawall on the heritage assets is especially significant, judging from Reimann et al.’s [12] finding on the effects of sea-level rise on Mediterranean UNESCO WHS. The researchers found that of 49 cultural WHS located in low-lying coastal areas of the Mediterranean, 37 were at risk from floods and 42 from coastal erosion. They further estimated that by the year 2100, the flood risk may increase by 50% and coastal erosion risk by 13% across the region, with considerable increases in effect on coastal WHS.

Similarly, McGreevy [3] reported the findings of a research that suggested climate change, not a tsunami, doomed the now submerged territory of Doggerland.

3.4. Sanitation. Proper sanitation at WHS is essential, but in many developing countries, the sanitation culture is so poor that people even defecate openly, including at the coasts or beaches. Open defecation has environmental and public health implications as many infections are spread through

<table>
<thead>
<tr>
<th>Category</th>
<th>Respondents</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 GMMB manager</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2 Tour guides</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3 Community leaders</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>4 Tourists</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5 Municipal authority</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6 Museums and monuments expert</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7 Sea defence engineer</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8 Youth of the community</td>
<td>12</td>
<td>12</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
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<td>Percentage</td>
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contact with human excreta. Bacteria, viruses, protozoa, and parasitic worms cause many diseases that are spread by direct contact or indirectly via contaminated food and soil [34, 35]. Respondents were asked how the construction of the sea defence had impacted the sanitation situation at the WHS. Typical responses from the various categories of respondents in connection with this are reflected in the following:

Open defecation (OD) around the castle was rampant before the construction of the sea defence. Since the sea wall was built, OD has reduced drastically (youth, female).

People no longer defecate in the neighbourhood of the castle, thanks to the sea defence project. Well, even if a few people still do it, the situation is far better in terms of regularity or frequency. It was appalling before the construction of the sea defence (community leader, female).

Open defecation (OD) is still done at the coast but not near the castle where the defence wall has been built. It shows that the sea wall has helped somehow to combat the despicable act (youth, male).

The sea defence project appears to have stopped open defecation near the castle. These days, one hardly sees the local people defecating indiscriminately at the beach near the castle (municipal authority official, male).

People used to defecate by heart around the castle, but it has reduced substantially, since the construction of the sea wall; it can even be said that it has stopped (youth, male).

OD was a common practice near the castle, but with the sea defence intervention, it has abated. This is a very healthy development (tour guide).

The heritage expert indicated that for a heritage property to be considered of outstanding universal value, the property must meet conditions of integrity, and for cultural properties, authenticity as well. Integrity relates to the “wholeness or intactness” of the heritage property and the value it holds. Open defecation is a threat to the integrity of the castle since the practice affects the value that the property holds and/or conveys as UNESCO world heritage. The reports show that the sea defence project had helped curb or at least reduce the unhealthy practice of OD, thus helping to improve the sanitary conditions around the UNESCO WHS. This is healthy for the integrity and OUV of the place because the literature paints a gloomy picture about improper sanitation, especially OD. OD increases the risk of exposure to pathogens that can pose health risks such as transferable infectious diseases, diarrhoea, typhoid, cholera, and viral infections [36] to the staff and visitors of the castle. One of the most effective ways to avoid this risk is to eliminate the environmental reservoirs of the microbes; another is to keep away from these reservoirs; therefore, stopping OD in the vicinity of the castle is good for sustainable heritage management [37] and development.

3.5. Aesthetics. It is argued in heritage literature [38–41] that image-based considerations make people spread good reports about a place; therefore, it is essential to make people perceive and actually see cultural heritage sites as aesthetically appealing. The heritage interactive space has a visual component that is essential for understanding users’ perception of heritage architecture [42]. As further argued by [43], cultural heritage managers have aesthetic obligations to perform to ensure that the heritage sites are aesthetically inviting. Informed by these from the literature, the respondents were asked if the sea defence project had any aesthetic implications for the global heritage site. Their typical views regarding this are captured in the following:

The castle environment was more natural when there was no seawall, but there is no doubt that the sea wall has enhanced the aesthetic magnificence of the castle environment (youth, male).

Certainly, the castle environment is more appealing to the eye than before the seawall was constructed. The sea defence has made the place more beautiful (youth, female).

I admire the sea wall so much; it makes the castle environment look very attractive (tour guide, male).

The castle is beautiful. The sea wall is also beautiful. Putting the two together, the scene here is more beautiful. Beautiful plus beautiful is equal to more beautiful. This is my own creation that fits the aesthetic appeal of the castle environment after the construction of the sea defence here (community leader, male).

The sea wall is an artificial creation, so the previous environment without the seawall was more naturally beautiful. However, the wall has added the artificial aesthetic element to it, so it is commendable. It has enhanced the beauty of the built environment (community leader, female).

The castle represents a masterpiece of human creative ingenuity. It is an outstanding example of a type of architectural ensemble that illustrates a significant stage in human history. The castle itself is a superlative building of exceptional beauty; however, the aesthetic appeal of its physical environment has been enhanced by the sea defence wall (castle manager).

World Heritage properties are places that are important to the global fraternity since they are an irreplaceable legacy that the global community has decided to protect for the future. Therefore, their aesthetic appeal must be maintained and enhanced for a better and more sustainable OUV of the heritage assets. The sea defence serves an aesthetic purpose in respect of the heritage site (heritage expert, male).

Surely, the sea wall has made the place nicer and more attractive (tourist, female).

Aesthetics is not the primary objective of the project, but it has come as an unintended advantage to the heritage monuments (sea defence engineer, male).
Although two (25%) out of eight categories of participants indicated that the castle environment looked more natural when there was no sea defence, the dominant perspective—six (75%) out of eight categories—indicated that the sea defence wall had made the heritage environment more aesthetically appealing. Even in the 25% of cases where the respondents emphasized the natural beauty (without the sea wall), they acknowledged that the sea defence wall had added the artificial aesthetic dimension to the natural dimension, thus solidifying the view that the sea defence project had increased the aesthetic value of the castle. This is qualitatively significant because, as noted by Elwazani [44], aesthetics is a pillar consideration in historic heritage preservation, restoration, and conservation. The 1964 Venice Charter declared that the aim of heritage restoration was to preserve and reveal the aesthetic and historic value of heritage monuments [45]. Although Page [46] criticized the fixation of the aesthetic values of heritage monuments, maintaining a property’s aesthetic value is a fundamental tenet of heritage management. In Tenen’s [47] view, this is probably why heritage aesthetics sometimes commands more public attention than the historic, scientific, or other significant attributes of the heritage resources.

3.6. Sand and Gravel Mining. Sati [48] posits that sand and stone are very useful resources for construction works, but unsustainable mining of the resources has a disruptive impact on the natural environment. Sand and stone mining activities are common in some coastal communities in Ghana, which could affect recreational beaches and coastal historical monuments and subsequently the tourism industry in the country. Respondents were asked about the effects of the sea defence on sand and gravel mining activities and the implications of these for the heritage assets. Characteristically representative responses from the various categories of participants were as follows:

Sand and gravel mining activities close to Elmina Castle have ceased with the construction of the sea wall. The activities were happening before the sea defence started although the government had banned them (municipal authority official, male).

Those who used to mine sand and gravels near the castle before the building of the sea wall now go elsewhere for these materials. Coastal sand and gravel operations have not stopped entirely, but they do not occur near the castles where the sea defence project has taken place (youth, female).

Sand mining goes on but on a limited scale compared to those days when there was no sea defence. Now people use sacks and buckets to fetch the sand in very small quantities, but it is not done so close to the castle (youth, male).

Since the sea wall was constructed, I have not seen anyone mining sand or gravels in the neighbourhood of the castle. The project has saved the castle from the unfavourable effects of sand mining and quarrying activities (tour guide, male).

I am not aware of sand mining and quarrying in the vicinity of the castle now. Despite the government’s ban on coastal sand and gravel mining in Ghana, the activities are still real in some coastal areas, but where the activities take place are far from the castle (community leader, female).

The sea wall has made it difficult to win sand and gravel from the castle area (sea defence engineer, male).

I think the sand mining and quarry operators now find it more difficult to operate than before the defence wall was constructed, and this is good for the stability and sustainability of the castles (heritage expert, male).

Quarry and sand mining activities no longer occur here. No, not in the direct vicinity of the castle (heritage manager, male).

The findings show that all the categories of participants were of the view that the sea defence project had helped abate the activities of illegal sand and gravel miners at the coastline, which exposed the castle to the ravages of the sea. The community leaders and youth further reported that before the sea defence project, the illegal operators were supplying sand and gravels at several places around Elmina to contractors or builders within the vicinity of the coast or locations several kilometres away. These contractors and builders usually engaged the services of youth residing in nearby communities to scoop the sand into the trucks for a fee. With regard to beach gravel and coastal stone quarry operations, contractors usually purchased products from residents who had sorted and graded stones into different size categories. With the construction of the sea defence, these operators were no longer seen around the castle areas. These pieces of evidence showed that sand and gravel mining activities had, at least, reduced to the barest minimum with the construction of the sea defence wall.

Several studies on Ghana’s shoreline attributed the retreat of the coastline to the practice of sand mining and indicated that this was harmful to coastal resources, including the forts and castles [13, 49–52]. Furthermore, Appeaning Addo and Appeaning Addo [53] found that despite the ban by the government on sand and gravel mining at the coast, the activities still went on and caused sea erosion in the coastal area harming properties, including the monumental infrastructure such as the castles. Furthermore, as reported by Arko [54], forts along the coast of Ghana, including Fort Williams at Anomabo, Fort Vredenburgh at Komenda, Fort Amsterdam at Abandze, and Fort Liszaamhied at Apam, Fort Good Hope at Senya Bereku, were all threatened by tidal inundation from the sea, and the effects were worsened by coastal sand and gravel mining. This suggests that if the construction of the sea defence wall (SDW) has stopped or even significantly reduced the sand mining operations in the neighbourhood of the WHS, it is good for the sustainability of Elmina Castle.

3.7. Heritage Tourism. In Ghana, the tourism sector is a very important one, as it offers employment to people and earns foreign exchange for the country. The sector is boosted greatly by the coastal historic monuments, particularly the castles and forts. The coastal heritage legacies were threatened by coastal erosion, which, among other reasons, necessitated the coastal sea defence. The sustainable development of the study area is closely linked to a buoyant tourism industry, which is expected to be promoted largely
by the coastal heritage asset—the castles and forts. As noted by Salazar [55], tourists tend to look for "authenticity" when travelling, and their choice of destinations is influenced by experiences enriched by matrices of expected experiences referred to as tourism imaginaries. The respondents were asked if the sea defence had any implication for heritage tourism. The typical findings concerning these are epito-
mized in the following quotes:

Yes, the sea defence project can promote tourism in respect of the castles. Since part of the wall around the castle was built, some tourists have been going to stand on it when they visit the castle. Some even take pictures of the wall and of themselves standing on the defence wall (community leader, female).

The sea defence wall can add to the tourism potential of the castle once it makes the environment nicer and neater (youth, male).

The defence wall has improved the landscape around the castle, so it is likely to positively influence or at least enrich the tourists’ experience of the castle (youth, female).

I have been, seeing some tourists standing on the defence wall to take a panoramic view of the castle and its surroundings. They take pictures of the castle scene and the defence wall. I guess the tourists are happy with the sea defence wall as a complementary attraction of the castle (municipal authority official, male).

Yes, it has added some form of attraction to the castle, but I came primarily to see the castle; the wall is a secondary matter. I did not even know about the seawall because the first time I visited the place it had not been constructed (tourist, male).

It is not clear whether the sea defence wall is adding to the tourism potential of the castle. I do not think the tourists will come over because a sea defence wall has been built here. What will certainly attract them are the history, beauty, and environmental cleanliness of the place. The SDW may add to these attractions, but the presence of the defence wall is not a primary consideration (heritage expert, male).

Sea defence wall or no sea defence wall, people will visit the castle because of the monument's historical and cultural significance. But I think the place is better with the wall than without it, so the wall is good for the castles. It's all part of the measures to protect and maintain the place for future generations and for tourism purposes (GMMB sitemanager, male).

The tourism potential of the castle is boosted by the historical antecedents, environmental conditions, hospitality of the staff and community people, and how the Ghana Museums and Monuments Board are able to market the castles to the local and international communities. The defence wall may help, but its effect on tourism promotion of the castle is minimal (tour guide).

In the view of the site managers, there was no evidence to show that the sea defence project had increased tourist attraction to the castle. However, what was certain was that visitors to the coast often based their choice of destination on the narratives of the coastal area. They often did not rely on their own experience but the stories of others and the branded images that were conveyed through representations in media, travel brochures, and the Internet. However, it is also possible that when prospective visitors see, hear, or read about the sea defence wall in addition to the castles' usual rich historical attractions, they may rate the place high as a tourist destination. In consonance with this evidence, Egberts and Dag Hundstad [56] argued that the promotion of tourist destinations relies heavily on narratives of places and their histories as unique and authentic. The authenticity of heritage, whether considered from a philosophical or tourism perspective, seeks to understand the concept in relation to the two complementary elements that characterize archaeological heritage as the physical remains of the past and the experience of continuously engaging with it [57, 58].

The findings show that the sea defence does not directly attract tourists to the castles, but it is good for the promotion of tourism. By implication, the sea defence wall does not only serve the purpose of checking sea erosion but also promotes tourism indirectly. At least, some tourists walk on the wall, and this enriches their experience. They also take photographs of the wall in addition to the castle. The presence of the wall has also reduced the spate of open defecation that used to be carried on at the beach, thus making the environment more tourist-friendly for visitors and staff alike. What has to be done, therefore, is to monitor to ensure that after some time the people do not revert to the poor sanitation habit around the castles.

3.8 Other Reports. So far, the evidence has shown that the sea defence project has positive implications for the coastal heritage properties. However, the reports were not all rosy as the participants also reported other effects to the contrary. The community leaders indicated that the wall had provided a more comfortable space for Indian hemp smokers. According to the community leaders, although the smokers were coming around to smoke before the sea defence project, the construction of the wall has provided a more comfortable place for them to engage in the smoking spree. The leaders reported, "we have never recorded any case where these smokers have harassed any visitor or tourist, but their activities still have to be closely monitored as prevention is better than cure."

In the words of the sea defence engineer, if the wall is not built throughout the coast, the situation will be better where it has been constructed, but the sediment concentration could increase in the areas where there is no wall. That is, the sea effects could cause havoc in other areas where this protective measure has not been taken. This is consistent with Kantamaneni et al’s [58] argument that any form of sea defence that reduces or prevents sediment loss from a previously eroding coastline reduces sediment supply to the beach and in so doing may contribute to increased erosion elsewhere. Similarly, Carter [59, 60] argued that if care is not taken in using sea defence as a coastal protective measure, sediment starvation in one area can be countered by sediment accumulation in another and vice versa.
4. Conclusion and Recommendations

The study set out to explore the effects of a sea defence project on a coastal cultural heritage asset—Elmina Castle, Ghana—which is a UNESCO WHS. The study established that the construction of the sea defence wall has positive implications for the said heritage asset. The project has strengthened the protective resilience of the castle by making it more resistant to the vagaries of the sea, improved sanitation in the property’s environment, stopped sand and gravel mining near the property, and enhanced the aesthetic attraction of the monument’s environment. The findings suggest that the project has improved the environmental sustainability of the heritage monument and the attraction of the coastal built environment. These developments are healthy for potential heritage tourism promotion, although it was not established that tourism has increased as a result of the construction of the defence wall. The beneficial developments not only augur well for the sustainability of the monument but also enhance the authenticity and integrity of the monuments, which ultimately shore up the outstanding universal value of the world heritage asset.

. The State Party, GMMB, UNESCO, local managers of the site, municipal authorities, and community leaders should ensure that the advantages and benefits that have accrued to the heritage sites from the construction of the sea defence project are protected and maximized. GMMB should lobby and support the State Party to extend the project to other coastal places in Ghana where similar monuments are located to enable those monuments to derive similar benefits. State custodianship and municipal and community ownership have to be nurtured and brought to bear on the nexus between the coastal engineering project and sustainable management of the site for sustainable development. In line with the SDG 17—partnership for development—the GMMB, the Government of Ghana, and UNESCO can leverage funding from other development partners for more sea defence projects to maintain and improve the sustainability and OUV of endangered coastal heritage monuments, not only in Ghana but also in Africa as a whole so that the monuments can continue to generate economic, scientific, cultural, historical, and educational values for sustainable development.

4.1. Limitations and Suggestions for Further Research. This was a qualitative case study involving relatively few respondents in a single study site, but the issue is widespread in Africa, implying that many other places with similar issues were not covered. Without significant intervention, some of Africa’s most important coastal heritage properties will be lost as a result of the direct and indirect impacts of climate change over the coming decades. There is a need for more research into the impacts of climate change on coastal heritage sites in Africa, not only to highlight the possible harmful effects of the hazards on the heritage assets but also to proffer interventional solutions to the threats for sustainable heritage management for sustainable development.

Data Availability

The data collected for the study are contained (used) in the article but may also be made available upon reasonable request and consent of the respondents.

Conflicts of Interest

The author declares that there are no conflicts of interest.

References


