ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED CONSTRUCTION OF A PROTECTION SEAWALL AT VASCO DA GAMA PILLAR IN MALINDI - KILIFI COUNTY

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List of abbreviations

ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EMCA	Environmental Management and Coordination Act
IUCN	International Union for Conservation of Nature
GOK	Government of Kenya
NEMA	National Environment Management Authority
NMK	National Museums of Kenya
TOR	Terms of Reference
COVID-19	Corona Virus Disease
ICT	Information and Communications Technology
SEA	Strategic Environmental Assessment
EA	Environmental Audit
EIA	Environmental Impact Assessment
MEA	Multilateral Environmental Agreements
NEAP	National Environment Action Plan
ICZM	Integrated Coastal Zone Management
KWS	Kenya Wildlife Service
MCS-	Monitoring, Control and Surveillance
DG	Director-General of the Service
KeFS	Kenya Fisheries Service
IUU	Illegal, Unreported and Unregulated fishing
LATF	Local Authorities Transfer Fund
MPAs	Marine Protected Areas
WASREB	Water Services Regulatory Board
WWDA	Water Works Development Agencies
PHA	Public Health Act
WHO	World Health Organization
KMA	Kenya Maritime Authority
KPA	Kenya Ports Authority
IEG	International environmental governance
KMFRI	Kenya Marine and Fisheries Research Institute
CDA	Coast Development Authority
SEM	Southeast Monsoon
NEM	Northeast monsoon
EACC	East African Coastal Current
MNP	Marine National Park
°C	Degree Celsius
m/s	meter per second
mm	Millimeter
M	meter
KM	Kilometer

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EXECUTIVE SUMMARY

Introduction and Background

Vasco Da Gama Pillar was built in the 16th century by the Portuguese to give them direction to India. In 1995 it was recognized as a national Monument vide Gazette Notice No. 445. This heritage monument is facing potential collapse due to erosion by tidal waters and water passages which have eaten into promontory weakening its stability. NMK is proposing marine engineering works project to restore the coral cliff and also undertake measures to mitigate further wave action on the site. Construction of the proposed protection Seawall will be undertaken around Vasco Da Gama Pillar along the Malindi Beach.

Objective and Methodology for conducting Environmental and Social Impact Assessment (ESIA) study.

The main purpose of the ESIA study was to:

a) establish a basis for constructing the proposed protection seawall by also assessing the sustainability of the project.
b) Describe the potentially affected environment
c) Identify and involve stakeholders
d) identify the possible negative environmental impacts that may result during the project's construction, operation and decommissioning phases and
e) propose appropriate mitigation measures for any negative environmental impacts to avoid, reduce, and remedy such impacts associated with the project.
f) Comply with the legal requirements and get approval from the Authority

The EIA guidelines as outlined under the Environmental Management and Coordination Act (EMCA 1999), Environmental Management and Coordination (Amendment) Act 2015, and the Environmental Impact Assessment/ Audit Regulations 2003 formed the basis of Terms of Reference (TOR) within which the EIA study was conducted. Other relevant legislations include the National Museums and Heritage Act of 2006 which consolidates the law relating to national museums and heritage. It provides for unfettered protection of heritage. Water Act, which provides for the Management, conservation, use and control of water resources and for the acquisition and regulation of rights to use water, The County government's Act 2012, Occupational Safety and Health Act 2007, Work Injury and Benefits Act 2007 among others. The Important national standards controlling environmental quality. The ESIA project Report will aid NEMA and relevant decision makers to approve or disapprove the development as they seek to balance the competing demands of preserving the Vasco Da Gama pillar, environmental protection and conservation, human health and safety as well as sustainable utilization of our diminishing natural resources.

Methodology:

The methodology involved both desk study (scoping) and field work. During the scoping stage, the potential impacts relevant to projects of this nature were identified and categorized. During the field work, the consultant carried out field observations, interviews with the proponent, neighbors and relevant authorities. This provided opportunities to simulate the concerns of various stakeholders, as well as, solicit their opinion on the mitigation measures. The team prepared a field schedule that included visits to;

- the Vasco Da Gama pillar
- Adjacent Beachfront
- Neighboring compounds (Armando Tanzini)
- KWS Malindi Marine Park Office

- Beach Management Unit/Fisheries Office
- National Museums of Kenya – Malindi Office
- Fort Jesus Seawall Site
- Underwater Assessment of marine environment using SCUBA Techniques/Snorkeling at the Proposed Seawall Site

Key findings and Recommended Mitigations:

Construction Phase	
Potential Impact	Mitigation Measure
Noise pollution	✓ The contractor will employ the best available work practices on-site to minimize occupational noise levels. ✓ Delivery of raw materials be limited to off peak hours which is between 10.00am and 4.00pm daily. ✓ Construction hours will be limited to the hours of 8.00 a.m. and 5.00 pm daily. ✓ Machinery, vehicles and instruments that emit high levels of noise will be used on a phased basis to reduce the overall impact. These equipment's such as drills, excavators and cement mixers will be used when the least number of residents are expected to be affected, for example during periods where most residents are at work or school. ✓ Create awareness for machine drivers to switch off engines when not in use. ✓ Regularly and maintain inspect all construction equipment in good working condition. ✓ Co-ordinate with relevant agencies regarding all construction activities. ✓ Provide appropriate PPEs for workers.
Exhaust and Dust Emissions	✓ Alternatively, fuelled construction equipment shall be used where feasible ✓ During construction, any stockpiles of earth should be enclosed / covered / watered during dry or windy conditions to reduce dust emissions; ✓ Construction trucks removing soil from the site, delivering sand and cement to the site should be covered to prevent material dust into the surrounding areas; ✓ All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction. This means that construction workers will be trained regarding the minimization of emissions during construction. ✓ Specific training will be focused on minimizing dust and exhaust gas emissions from construction vehicles. Drivers of vehicles used during construction will be under strict instructions to minimize unnecessary trips and minimize idling of engines. ✓ During construction, where water is available, sprinkle the construction area with water to keep dust levels down. ✓ Provide masks to all personnel in areas prone to dust emissions throughout the period of construction. ✓ Supervise drivers of construction vehicles not to leave vehicles idling, and limit their speeds so that dust levels are lowered. ✓ Maintain all machinery and equipment in good working order to ensure minimum emissions including carbon monoxide, NOX, SOX and suspended particulate matter.

Disposal of Excavated Soil	✓ Reuse excavated material in back filling areas excavated. ✓ Excess excavated materials to be disposed in authorized dumping site. ✓ Spoil materials on site to be removed accordingly. ✓ Avoid placing excavated soils near water ways. ✓ It is recommended that part of the topsoil excavated from the proposed construction site be re-spread in areas to be landscaped to enhance plant health.
Increased water demand	✓ Ensure efficient water use on site by sensitizing construction staff to avoid wastage. ✓ Use sea water can be used for activities that do not require fresh water and are not likely to cause pollution.
Workers accidents and hazards during construction	✓ Report any accident on site within 12 hours. ✓ Conduct investigations of the accident and file the prepared report within 48hours. ✓ Provide workers on site with appropriate PPE. ✓ Erect appropriate signs on the site to warn workers and visitors. ✓ Ensure that the drivers and machine operators hired are qualified and experienced. ✓ Provide first aid kit and a trained first aider be always be on site ✓ No worker should be allowed on site under the influence of alcohol or other inebriating substances. ✓ Display at prominent places occupation health and safety rules. ✓ Test and approve equipment such as ladder before use. ✓ Appropriate insurance should be acquired as per the law. ✓ Develop and display and emergency evacuation procedure. ✓ Moving parts of machines should be guarded to protect workers from injury.
Energy Consumption	✓ Sensitize project staff to ensure responsible electricity use at the construction site to conserve electricity by switching off electrical equipment or appliances when they are not being used. ✓ Plan transportation of materials to ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. ✓ Minimize Artificial Lighting and Make Use of Skylight Windows. ✓ Install Motion Sensitive Light Switches. ✓ Establish Energy Efficient Practices. ✓ Properly Maintain Office Equipment.
Extraction and Use of Building Materials	✓ Source building materials such as sand, ballast and hard core from registered quarry and sand mining firms whose projects have undergone satisfactory Environmental Impact Assessment/Audit and received NEMA approval. These firms are expected to apply acceptable environmental performance standards, the negative impacts of their activities at the extraction sites are

	considerably well mitigated. ✓ Reduce negative impacts on availability and sustainability of the materials, contractor should only order for what will be required through accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities. ✓ Discourage wastage, damage or loss (through run-off, wind, etc.) of materials at the construction to reduce additional demand for and extraction or purchase materials. ✓ Encourage reuse of building materials and use of recycled building materials. This will lead to reduction in the amount of raw materials extracted from natural resources as well as reducing impacts at the extraction sites.
Solid Waste Generation	✓ Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time ✓ Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements ✓ Purchase of perishable construction materials such as paints incrementally to ensure reduced spoilage of unused materials ✓ Use building materials that have minimal packaging to avoid the generation of excessive packaging waste ✓ Use construction materials containing recycled content when possible and in accordance with accepted standards. ✓ Adequate collection and storage of waste on site and safe transportation to the disposal sites and disposal methods at designated area shall be provided.
Soil Erosion	✓ Terrace and level the project site to reduce run-off velocity and increase infiltration of rain water into the soil. ✓ Restrict construction vehicles to designated areas to avoid soil compaction within the project site and rip any compacted areas to reduce run-off. Surface runoff and roof water from temporary site offices shall be harvested and stored reservoirs for reuse. ✓ Re-vegetate exposed areas around the site so as to mitigate erosion of soil by storm water runoff. The final site grade should facilitate drainage and avoid flooding and pooling. ✓ Prepare a site drainage plan to protect against erosion. ✓ Protect stockpiles through the use of silt fencing and reduced slope angles should be used to minimize soil erosion during construction. ✓ Install drainage ditches, construction of runoff and retention ponds where necessary. ✓ Minimizee disturbances and scarification of the surface to reduce erosion impacts. ✓ All slopes and working surfaces should be returned to a stable condition and topsoil on the final site would be graded and planted as appropriate.
Oil Spills Hazards	✓ Prepare an oil spill emergency response plan ✓ Implement preventive measures to avoid oil spills ✓ Report any spill to the relevant authorities to activate response mechanisms
Destruction of existing	✓ Identify important stands of vegetation, large contiguous stands of forest or other habitat, vegetation on steep slopes, and stream corridors or swales.

vegetation	✓ Incorporate these areas into design layout or open space system. ✓ Protect such areas during construction by temporary fencing and limitations on access for heavy machinery and materials storage.
Fire Outbreaks	✓ Provide firefighting equipment of recommended standards and in key strategic points all over the proposed project site of the proposed seawall. ✓ Prepare a fire evacuation plan and must be posted in various points of the including procedures to take when a fire is reported. ✓ Train all workers on fire management and fire drills undertaken regularly.
Loss of Heritage Resources	✓ Undertake archaeological excavation to rescue. This will be done through complete documentation and excavation for all archaeological artifacts on land. The excavation will be undertaken at Portuguese Chapel, in the compound of Mr. Aramando Tanzini, who is the immediate neighbor of the Pillar and the Kilifi County Fisheries area. ✓ Ensure documentation and retrieval of the underwater artifacts within construction areas earmarked for excavation, backfilling. ✓ Rescued materials will be given on-site conservation treatment before removal to Malindi Museum. ✓ Survey and document any identified shipwreck site. These sites will be secured by covering with appropriate materials such as debris nets and sandbags. ✓ Document all cultural heritage in the intertidal area likely to be impacted by the project. ✓ Study and document traditional boat landing sites. These sites have histories from their occupation sequences / chronologies as they have existed for many years. In this case, the landing site of Baobab that is within the Vasco da Gama seawall Project will be archaeologically studied and documented.
Manage Road Traffic Congestion	✓ Provide for safe environment for all road users. ✓ Provide protection for workers, visitors, and the general public from traffic hazards that may rise as a result of the construction activity. ✓ Minimize the disruption, congestion and delays to all road users. ✓ Ensure that appropriate and sufficient warning and information signs and guidance are provided on site. ✓ Ensure that all needs of road users; motorists, pedestrians, cyclists, public transport passengers are accommodated at and through the work site.
Construction generated turbidity	✓ Adopt engineering procedures during construction that minimizes sediment resuspension in the water column and transport by wind and currents to these habitats ✓ Use appropriate anchoring techniques to minimize boat damaging sea bed bottom

	✓ Prepare reef restoration contingency plan in case of heavy impacts from the project action. ✓ Implement an environmental monitoring programme on habitat and biodiversity to minimize any adverse effect are detected and minimized as early as possible.

Operation Phase	
Potential Impact	Mitigation Measure
Solid waste management	✓ Manage solid waste at the newly refurbished Vasco Da Gama monument which will lively experience increased visitor traffic. ✓ Develop guidelines on visitor conduct and provide facilities to solid waste management collection and sorting. ✓ Adhere to all NEMA guidelines on waste handling for different waste categories. ✓ Conduct annual audit of the site to ensure solid waste is well managed.
Water Pollution Control	✓ Ensure all waste water will be handled as required by the NEMA Waste Management guidelines. The site will have to adhere to all rules governing waste water treatment. This will be crucial in ensuring that waste water discharged into the environment will not too harmful to the receiving environment.

Decommissioning Phase	
Potential Impact	Mitigation Measure
Noise and Vibration	✓ Install portable barriers to shield compressors and other small stationary equipment where necessary. ✓ Use quiet equipment (i.e. equipment designed with noise control elements). ✓ Co-ordinate with relevant agencies regarding all demolition activities. ✓ Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible. ✓ Demolish mainly during the day. The time that most of the neighbours are out working.
Solid waste management	✓ Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of demolition waste generated during decommissioning phase ✓ Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements ✓ Adequate collection and storage of waste on site and safe transportation to the disposal sites and disposal methods at designated area shall be provided.
Air pollution	✓ Water all active demolition areas as and when necessary to lay off dust. ✓ Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard. ✓ Pave, apply water when necessary, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at demolition sites.

Conclusion

The analysis of the ESIA has revealed the proposed protection seawall at Vasco Da Gama in Malindi will have positive impacts to the Proponent and the national heritage at large. The impacts will include preservation of the Vasco Da Gama pillar, employment to local community members, increase in the national/local investment, increase in Government revenue, boost in tourism experience. However, despite the outlined positive impacts, the proposed development will cause some negative impacts such as Noise Pollution, dust generation, Soil erosion, solid waste generation, Occupational hazards among others.

An Environmental and Socio- economic Management Plan (E&SMP) has been developed to ensure sustainability of the project area activities from construction through operation to decommissioning. The plan provides a general outlay of the activities, associated impacts, mitigation action plans and appropriate monitorable indicators. Implementation timeframes and responsibilities are defined, and where practicable, the cost estimates for recommended measures are also provided.

From the findings of this study, the following conclusions are made:

- The adverse impacts are temporary during the construction phase and can be managed to acceptable levels with the implementation of the recommendation of the mitigation measures proposed in the ESMP.
- The potential adverse impacts associated with the proposed project can be mitigated successfully. Most of the negative impacts are temporary, short term and reversible.
- The project will be designed, constructed, and operated according to international best practices. Successful implementation of the proposed ESMP will ensure environmental sustainability.
- The proposed project has high value socio-economic benefits which if neglected can cause irreversible loss of Vasco Da Gama pillar in Malindi a key national monument. In addition, its implementation would boost tourism sector in Kilifi county.

The proposed project design has integrated mitigation measures with a view to ensuring compliance with all the applicable laws and procedures. The protection seawall and associated structures will be constructed to the required planning/architectural/structural designs and standards. During project implementation, operation and decommissioning stages **sustainable environmental management (SEM***)* would be ensured; avoiding inadequate use of natural resources, conserving nature sensitively and guaranteeing a respectful and fair treatment of all people working on the project, general public at the vicinity and the expected beneficiaries of the project.

1.0 INTRODUCTION

The National Museums of Kenya (NMK) is a state corporation established by an Act of Parliament, the National Museums and Heritage Act, 2006 no. 6 of 2006. NMK is a multi-disciplinary institution whose role is to collect, preserve, study, document and present Kenya's past and present cultural and natural heritage. They manage several historical sites and monuments in Kenya, among them, Vasco da Gama Pillar Malindi, Kilifi County.

Vasco Da Gama Pillar was built in the 16th century by the Portuguese to give them direction to India. In 1995 it was recognized as a national Monument vide Gazette Notice No. 445. This heritage monument is facing potential collapse due to erosion by tidal waters and water passages which have eaten into promontory weakening its stability. NMK is proposing marine engineering works project to restore the coral cliff and also undertake measures to mitigate further wave action on the site. Construction of the proposed protection Seawall will be undertaken around Vasco Da Gama Pillar along the Malindi Beach.

In the second schedule of the Environmental Management and Coordination Act of1999 and 2015 amendments, seawall projects fall under high risk project that require a full study to be undertaken. As part of the environmental compliance for this project as provided by National Environmental Management Authority (NEMA), NMK has secured the consultancy services of NEMA certified team of experts to carry out an environmental and social impact assessment for the proposed project.

1.1 History of the Vasco Da Gama Pillar

Vasco Da Gama is a very unique monument. The fifteenth century was an era of worldwide exploration by Portugal. Early in the century a Portuguese King had conceived the idea of commemorating visits of Portuguese vessels to different domains by erecting a pillar (known as a padrao) surmounted by a cross and embellished with the Portuguese crest of arms. In 1497, King Dorn Manuel of Portugal appointed Vasco da Gama to command a fleet of four ships to proceed to India via the southern and eastern coasts of Africa in search of the famous spice islands of the far east. The fleet left Portugal on the 8th July, 1497, and after many adventures, anchored off Malindi on Easter Sunday, the 15th April, 1498. The visit lasted for nine days and the fleet was well received by the Sultan of Malindi with supplies of fresh fruit and vegetables being made readily available. At the request of Da Gama, who incidentally refused to go ashore during the visit, the Sultan also produced a pilot from Gujarat in India who, in due course, guided the fleet across the Indian Ocean to Calicut.

It is probably the warm welcome that Da Gama received on this occasion which made him decide to visit Malindi again on his return voyage in 1499, and his sailors were allowed to erect the pillar and cross on the high ground near the Sultan's palace on the hilly area above the present jetty, possibly as a leading marker to guide future seafarers. The cross was of Lisbon limestone and bore the arms of Portugal (still faintly visible), but unfortunately this very Christian symbol caused grave discontent in the Muslim community and it was soon taken down. Later however, after representations from the small Portuguese community that by then had established a Factory, or trading post, in Malindi, the Sultan permitted the pillar to be re-erected at its present site. This pillar is the only known original ***padrao*** out of several placed at various points around the African coastline by the Portuguese explorers.

Figure 1: View of the project site at Vasco da Gama pillar during low tide

The Pillar has become synonymous with Malindi Town. Further, the relationship between the Pillar and the town of Malindi in terms of history, culture and tourism has largely remained unchanged to this date. The Pillar has been a significant symbol of the interchange of cultural exchanges and international trade networks and influences between the African and western civilizations which are still visible in Malindi town today.

1.3 Threats to the Vasco Da Gama Pillar

Over the years the headland on which the Pillar stands has been undermined by the action of the sea. This pillar has over the years, been experiencing menacing threats from the sea that has led to sections of the bedrock on which it stands cracking and some falling into the sea. At the moment, the pillar is facing eminent collapse. Shoreline changes due to rising sea level changes resulting from global warming is not a phenomenon expected to end any time soon. As such, threatening wave action on the Pillar will continue with eventual collapse of the monument. Restoration works to the pillar were undertaken in the 1950's by the government of Kenya where the support bedrock was reinforced with concrete abutments. This involved construction of concrete supports reinforced with steel and concrete spalls. These however have

not withstood the menacing sea waves that have seen these supports cracking, steel oxidizing and sections of the promontory cracking and collapsing into the sea. The pillar and its support base are again in

Figure 2: Top Left - Exposed Crack on the Vasco Da Gama Base Rock

Figure 3:Top Right: Frontal view of the pillar holding the Vasco Da Gama pillar

Figure 4:Bottom Left: Concrete block placed in front of the site to prevent erosion

Figure 5: Bottom Right: Water path beneath the Vasco Da Gama pillar

The photos in figure 6 reveal cracks on the column stubs and corbels. Excessive erosion of concrete cover over reinforcement for slab soffit and column corbels is also evident. This compromises the

structural integrity of the pillar support structure. The continued exposure to harsh wave actions will only exacerbate the deterioration. Therefore, urgent mitigation measures are inevitable.

Figure 6: Photos of Extensive damage to the pillars supporting the Base Rock of Vasco Da Gama pillar

1.4 National Agencies Reports on Threats to Vasco Da Gama Monument

National Agency	Document	Concerns Expressed	Recommendation
National Environmental Management Authority, Kenya	Kenya Shoreline Management Strategy Draft Report Volume II: Cell Description Project Number 62800145 / 03	Heritage sites within this cell include Vasco de Gamma pillar, Mambrui Mosque Ruins and the Portugese Chapel in Malindi town. Some are under threat from shoreline erosion.	For example, works to strengthen the toe of the headland supporting the Vasco de Gamma pillar has been undertaken.
Ministry of Environment and Mineral Resources NEMA -Kenya	Integrated Coastal Zone Management (ICZM) Action Plan for Kenya, 2010 - 2014	National and world heritage areas attract tourism, supporting regional economic development. Both domestic and international tourism contribute towards the conservation of cultural heritage in Kenya. In recent years, however, cultural heritage has been under increasing pressure from population growth, deforestation, farming and uncontrolled tourism. Seven Kaya sites have been listed as UNESCO Heritage Sites which is a safeguard measure for the protection of this natural and cultural heritage.	The National Museums and Heritage Act, 2006 consolidates and repeals the Antiquities and Monuments Act 1983 (Cap. 215) and the National Museums Act 1983 (Cap. 216) into one law that governs museums and heritage in Kenya. Protected under this Act is natural and cultural heritage such as archaeological finds, submerged settlements and shipwrecks within territorial seas of Kenya as well as historical monuments. The Act has also adopted the undertaking of EIA to protect heritage sites. Preserve, protect and ensure the integrity of cultural and natural heritage.
National Environmental Management Authority, Kenya DHI Water & Environment (M) Sdn Bhd	Kenya Shoreline Management Strategy/Malindi Sample SMP 628000145	Accretion affecting the Vasco Da Gama pillar	Protect Vasco de Gamma pillar - high. Management Strategy - Ongoing maintenance and protection of cliff base under the Vasco de Gamma Pillar.
Kenya Wildlife Service (KWS)	Malindi Marine Protected Area Management Plan 2016-2026	This historical Pillar is threatened by wave action which has eroded the reef terrace on the Pillar	Reinforcement of the pillar bedrock. Sanitation facilities.

		headland. This phenomenon is historical as demonstrated by earlier efforts to support the reef terrace using reinforced concrete pillars and reduce the velocity of waves using concrete boulders. However, only the western side of the pillar was stabilized and hence the southern and eastern sides of the pillar are gradually but steadily collapsing under wave action. Even the stabilized areas are showing signs of degrading, which can be attributed to the rusting of the steel reinforcements. The infrastructure at the Pillar such as seats, information boards and signage are also dilapidated. Sanitation facilities (toilets and wash areas) are also lacking.	

Table 1: National Reports Touching on Vasco Da Gama pillar

1.4 Terms of Reference

The purpose of the consultancy was to carry out an Environmental and Social Impact Assessment (ESIA) for the proposed Sea Wall earmarked for construction around Vasco da Gama pillar along the Malindi beach. The ESIA was conducted as per NEMA provisions of the EMCA 1999, and Environmental (Impact Assessment and Audit) Regulations 2003 as well as other environmental regulations (statutory requirements), identify environmental impacts of the proposed project and develop an environmental management and monitoring plan to be used throughout the life of this facility. The ESIA identifies constraints, risks, impacts and mitigation measures for the proposed project. The assessment considers biophysical, heritage and socio-economic components with a strong focus on the heritage component, especially issues which may exist around protection of historical monuments. The ESIA has been conducted to appraise and provide input on the feasibility and design of the proposed project as well as to inform ultimate implementation and associated mitigation measures.

Specifically, the qualified consultants undertook to;

- Identify the anticipated environmental, heritage and social impacts of the proposed construction of the seawall at Vasco Da Gama pillar and the scale of the impacts;

- Identify and analyze alternatives to the proposed project;
- Propose mitigation measures to be taken during and after the implementation of the projects; and
- Develop an environmental management plan with mechanisms for monitoring and evaluating the compliance and environmental performance.

2.0 APPROACH AND METHODOLOGY

This chapter provides an overview of the approach and methodology adopted during the scoping and assessment phases of the ESIA. This methodology is utilized in determining the significance of the potential operational (long-term) and construction (short-term) impacts on the biophysical, heritage and socio-economic environment associated with the proposed development. The assessed impacts were initially identified in the scoping stage and are subsequently subject to detailed investigation and assessment based on prevailing conditions. The table below summarizes the steps utilized in undertaking this study.

Component	**Steps**
Preliminary Approval of Terms of Reference	Submission and Approval of Terms of Reference by NEMA
Scoping	Gain an understanding and study project objectives and familiarize with project locations ✓ Obtain necessary documents on Vasco Da Gama pillar including maps, site plans, photographs, diagrams, and any visual and graphic aids. ✓ Familiarize with project, including project purpose; location; components and phases; workforce and equipment; associated activities; schedule; and cost. ✓ Gather information about pre-construction, construction, and operation plans. ✓ Detail the elements of the project, highlighting the areas to be reserved for construction and determining the surrounding areas in terms of residential areas, industrial areas, protected areas, historical sites, etc. Review relevant legislative and regulatory considerations ✓ Review national legislations and regulations relevant to the project, including also required governmental permits and authorizations. ✓ Review international guidelines on seawall construction ✓ Prepare reports to meet the requirements of the existing national regulatory agency guidelines.
Stakeholder Engagement	Initiate Stakeholder Mapping ✓ Identify stakeholders of the project ✓ Undertake stakeholder analysis based on interests and influence ✓ Develop a stakeholder maps for the project area ✓ Introduce the consulting team to key stakeholders ✓ Undertake stakeholder consultations

Baseline Review	Generate Baseline Information from Scoping Outcome ✓ Create proposed alignment, general layout of facilities at project site ✓ Create area maps at appropriate scales to illustrate general siting of project related development sites and surrounding areas likely to be environmentally and socially affected ✓ Present topographic contours and bathymetric maps as available, as well as locations of surface waters, roads, parks and reserves, and political boundaries ✓ Illustrate existing land use, including industrial, residential, commercial and institutional development, agricultural, etc. ✓ Physical Environmental Data: ▪ Geology (e.g. stratigraphy and structure, seismic history if any of the areas) ▪ Topography (e.g. drainage patterns around the pipeline construction areas, view-shed around facilities) ▪ Soils (e.g. bearing capacity of soil, agriculture value, soil cover in residue disposal) ▪ Climate and meteorology ▪ Ambient air quality ▪ Ambient water quality ▪ Surface water quality ▪ Surface water hydrology ▪ Receiving water quality (other major pollution sources in the area, if any) ▪ Ground water table condition of the study area ▪ Ambient noise (note contribution from major sources if any) ▪ Significant sources of pollution in the area and prospect for their mitigation ▪ Existing traffic patterns, types of roads, etc. ✓ Biological Environmental Data: • Flora and fauna, including rare or endangered species in areas adjacent to project-related development sites • Sensitive habitats; including wetlands, parks or reserves, significant wild lands, forests within or in areas downstream/downgrading of project-related development areas. • Species of commercial importance in areas affected by

	the project. ✓ Socio-Economic Data • Cultural and Heritage Valuable Sites • Geography, administrative districts, etc. • Basic Demographic characteristics (population, age structure, birth rate, death rate, rate of natural increase, handicapped, etc.) • Living Conditions (household size and density, access to electricity, source of potable water, sanitation, etc.)
Preliminary Assessment	Identify Relevant Positive and Negative Project Aspects ✓ Environmental impacts ✓ Heritage Impacts ✓ Social Impacts ✓ Economic impacts ✓ Institutional impacts o Explain and justify the methods used to predict potential impacts of the project on the environment, and on interactions among the project components o Nominate and classify issues that are potentially important in the assessment of impacts and for decision-making in relation to the project o Identify potential impacts in the construction and operation phase by conducting an impact analysis on the physical, biological, land-use and socio-economic environments, and the interactions among them. o Evaluate the impact significance of the project components and activities on the environment and society o Establish that criteria on which the assessment of the impacts will be based o Develop a matrix as a means to present assessment of the impacts graphically, and specify and discuss positive or negative impacts, direct or indirect impacts, reversible or irreversible impacts, short-term and long-term, and cumulative avoidable impacts on the environment and society
Alternatives	Analyze alternatives ✓ Design Alternatives - Consideration of different designs in an attempt to optimize local benefits and sustainability would constitute design alternatives.

	✓ Alternative Materials and Technology – This may include the proposed change of materials proposed to minimize impact or change technology applied to improve efficiency and performance. ✓ Site Layout Alternatives - This permits consideration of different spatial configurations of the seawall on site. This may include siting of a particular structure either prominently to attract attention or screened from view to minimize aesthetic impacts. ✓ No Project Alternative - It assumes that the activity does not go ahead, maintaining the status quo.
Environmental and Social Management plans	✓ Detail the management measures, roles, and responsibilities for implementation, supervision, and cost ✓ Indicate parameters to be monitored, their location, frequency of monitoring, roles and responsibilities and cost ✓ Assess the ability of the implementing agencies to implement the proposed environmental management and monitoring plan ✓ Enumerate the institutional arrangement and capacity building programs necessary to ensure successful implementation

Table 2: ESIA Study Methodology

2.1 Report Structure

The report structure will be in accordance with the draft Environmental (Strategic Assessment, Integrated Impact Assessment and Audit) Regulations, 2017. Its contents include but not limited to:

- ✓ the nature of the project;
- ✓ the location of the project including the physical area that may be affected by the project's activities;
- ✓ the activities that shall be undertaken during the project construction, operation and decommissioning phases;
- ✓ the design of the project;
- ✓ the materials to be used, products and by-products, including waste to be generated by the project and the methods of their disposal;
- ✓ the potential environmental impacts of the project and the mitigation measures to be taken during and after implementation of the project;
- ✓ an action plan for the prevention and management of possible accidents during the project cycle;
- ✓ a plan to ensure the health and safety of the workers and neighboring communities;
- ✓ the economic and socio-cultural impacts to the local community and the county in general;
- ✓ a summary of issues discussed at the public participation forum;
- ✓ an environmental management plan;
- ✓ integration of climate change vulnerability assessment, adaptation and mitigation actions;
- ✓ the project budget; and
- ✓ any other information the Authority may require.

2.2 Team of Experts

The team undertaking this study are identified in the table below.

	Name	Expert Registration No.	Years of Experience	Specialization
1.	Ali Mwachui	6805	16 Years	Environmental Management and Marine Conservation
2.	Clamson Ogutu	0524	16 Years	Environmental Management and Occupational Health and Safety (Approved OSH/ADV No. 113)
3.	Dr. Jelvas Mwaura		5 Years	Marine Ecology
4.	Dr. Ceasar Bita		20 Years	Supervising Archeologist
5.	Eng. Mark Vuhasio		10 Years	Civil/Water Works Engineer

Table 3: ESIA Team of Experts

2.3 Documents Review and Desk Study

The team of experts did a preliminary review of shared project documents and identified data gaps. This was communicated to the client who in turn made efforts to fill the data gaps that were discovered in the initial documents review for various aspects. Below are the final details of information provided by the client.

S/N	Required Information	Document/Information Provided	Relevance
1.	Historical Significance of Vasco Da Gama	Heritage Assessment of the Vasco Da Gama Pillar	High
2.	Condition of Vasco Da Gama Pillar	Report on Structural State of Malindi Pillar – Remedials and Mitigations	High
3.	Tourism Demand/Visitor Data	Access to Visitors Book at the Pillar	High
4.	Stakeholders	List of Stakeholders in Malindi	High
5.	Seawall Design Details	Seawall Section Drainage Details	High
6.	Heritage Impact Assessment and Mitigation for the Construction of a Seawall at Vasco Da Gama pillar in Malindi	Heritage Impacts	High

Table 4: Clients Documents Reviewed

2.4 Public Consultations and Stakeholder Engagements

Public participation is a process aimed at involving persons directly and indirectly affected by a project in decision making process, promoting sustainable decisions by providing them with information they need to be involved in a timely and meaningful way. It is an integral part of the Environmental Assessment as provided for in the Constitution of Kenya, 2010, the Environmental Management and Coordination Act, 1999 and the Environmental (Impact Assessment and Audit) Regulations 2003. The process is normally achieved through holding meetings and barazas to discuss the pros and cons of a project, however during this period of the Corona Virus (COVID-19) pandemic such action may exacerbate the spread of the virus and put more persons at risk. It was for this reason that NEMA released guidelines on conducting public participation for EIA, EA and SEA. The guidelines propose the use of ICT Innovations and use of comprehensive questionnaires among other measures to reduce risks associated with the spread of COVID-9 virus.

The consulting team avoid meetings since they would contravene the ban on all public events and the requirement for social distancing as ordered by the government. Experts opted for comprehensive questionnaires and key informant interviews (Ann Robertson).

After identification of project stakeholders, an analysis was undertaken to describe and classify all stakeholders, their interests and influence on the project.

2.5 Field Survey

The team prepared a field schedule that included visits to;

- the Vasco Da Gama pillar
- Adjacent Beachfront
- Neighboring compounds (Armando Tanzini)
- KWS Malindi Marine Park Office
- Beach Management Unit/Fisheries Office
- National Museums of Kenya – Malindi Office
- Underwater Assessment of marine environment using SCUBA Techniques/Snorkeling at the Proposed Seawall Site

Figure 7: Initial site visit by the ESIA Team at the Vasco Da Gama Pillar

Figure 8: Malindi town and the Vasco de Gamma pillar headland. Numerous fishing boats are docked in

Figure 9: Existing Boulders placed on the northly edge of the pillar to break wave energy of the NEM winds

3.0 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

3.1 Introduction

The Constitution of Kenya 2010 and other new developments like climate change marked an important chapter in Kenya's environmental policy development. Hailed as a 'Green' Constitution, it embodies elaborate provisions with considerable implications for sustainable development. These range from environmental principles and implications of Multilateral Environmental Agreements (MEAs) to the right to a clean and healthy environment as enshrined in the Bill of Rights. Chapter V is entirely dedicated to land and environment. It also embodies a host of social and economic rights which are of environmental character such as the right to water, food and shelter, among others.

Previously, environmental requirements were captured through periodic development planning cycles. Whole sections or chapters of successive National Development Plans dealt with environment since independence. Modern day environment management and planning in Kenya can be traced to the Rio Earth Summit of 1992. It helped a great deal in raising the understanding of the link between environment and development. Following the Summit, Kenya initiated the National Environment Action Plan (NEAP) process completed in 1994. It recommended the need for a national policy and law on the environment, later culminating into the Sessional Paper No. 6 of 1999 entitled Environment and Development. Kenya's first framework environmental law the Environmental Management and Coordination Act (EMCA) No. 8 of 1999 was born thereafter.

3.2 National Environmental Policy

Kenya's National Environmental Policy Document published in 2013 provides a framework to guide the country's efforts in addressing the ever-growing environmental issues and challenges such as:

- Environmental governance
- Loss of biodiversity
- Valuation of environmental and natural resources
- Rehabilitation and restoration of environmentally degraded areas
- Climate change, energy, security and disaster management
- Public participation, environmental education and awareness
- Data and information
- Poverty
- Chemicals Management among other issues.

Other policies that complement the National Environment Policy are Integrated Coastal Zone Management (ICZM), Blue Economy, National Oceans and Fisheries policy, Water Policy, Wetlands Policy, National Land Policy, Forestry and Wildlife Policy and many more that steer sustainable development in Kenya.

3.3 Legislative Frameworks

The Kenya Environmental law describes the legal rules in Kenya relating to the environment, and more broadly the social, economic, philosophical and jurisprudential issues raised by attempts to protect, conserve and reduce the impacts of human activity on the Kenyan environment. It is therefore useful to point out that the current legal framework on the environment and environmental rights is a product of a prolonged clamor for a comprehensive legal

regime to address these problems. The framework for the sustainable management and protection of the environment is provided by the Environmental Management and Coordination Act (EMCA 1999) and the Environmental Impact Assessment / Audit Regulations (EIA/EA)2003 and give the guidelines for the EIA process. Environmental Legislation is also contained in about 77 statutes of the Kenyan Acts of Parliament. Most of the statutes are sectoral either by the natural resources such as fisheries, water, forestry and wildlife, or by the functional sectors such as public health, agriculture, factories, mining, the Physical planning, Land, the County Government among others. This ESIA project report will briefly review relevant legislations that will ensure environmental stress originating from the implementation of the project is eased.

3.4 The Constitution of Kenya, 2010

The new Constitution of Kenya, states that everyone has a right to a clean and healthy environment in Section 42:

"Every person has the right to a clean and healthy environment, which includes the right:

a. To have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69; and
b. To have obligations relating to the environment fulfilled under Article 70.

The Constitution identifies the responsibility of the national government in respect to the environment in Sections 69 and 70:

Section 69

1) The State shall—

a. ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources, and ensure the equitable sharing of the accruing benefits;
b. work to achieve and maintain a tree cover of at least ten per cent of the land area of Kenya;
c. protect and enhance intellectual property in, and indigenous knowledge of, biodiversity and the genetic resources of the communities;
d. encourage public participation in the management, protection and conservation of the environment;
e. protect genetic resources and biological diversity;
f. establish systems of environmental impact assessment, environmental audit and monitoring of the environment;
g. eliminate processes and activities that are likely to endanger the environment; and
h. utilize the environment and natural resources for the benefit of the people of Kenya.

2) Every person has a duty to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.

Section 70:

1) If a person alleges that a right to a clean and healthy environment recognized and protected under Article 42 has been, is being or is likely to be, denied, violated, infringed or threatened, the person may apply to a court for redress in addition to any other legal remedies that are available in respect to the same matter.

2) On application under clause (1), the court may make any order, or give any directions, it considers appropriate: -

   a. to prevent, stop or discontinue any act or omission that is harmful to the environment;

   b. to compel any public officer to take measures to prevent or discontinue any act or omission that is harmful to the environment; or

   c. to provide compensation for any victim of a violation of the right to a clean and healthy environment.

3) For the purposes of this Article, an applicant does not have to demonstrate that any person has incurred loss or suffered injury.

3.5 Environmental Management and Coordination Act 1999

The Environmental Management and Coordination Act (EMCA) of 1999, and its attendant Environmental (Impact Assessment and Audit) Regulations of 2003 provides for the establishment of an appropriate legal and institutional framework for the management of the environment in Kenya. In the Second Schedule it provides a list of projects for which carrying out an EIA process is mandatory. This project falls under high risk projects as outlined in second schedule and subsequent regulations. It is mentions sea walls under water resources and related infrastructure.

The Act also sets a requirement of Annual Environmental Audits in order to mitigate and control environmental damage from ongoing projects. Sections68 and 69 of the EMCA require that all ongoing projects be subjected to annual environmental audits as further expounded in Regulation 35 (1) and (2) of Legal Notice101 of June 2003.

Other Regulations relevant to this assignment include:

3.5.1 EMCA (Waste Management) Regulations, 2006

The Waste Management Regulations (2006) are contained in the Kenya Gazette Supplement No 69, Legal Notice No 121 of immediate relevance to proposed development for the purposes of this scoping report is Part II, Sections 4(1-2), 5 and 6.

Section 4 (1) states that 'No person shall dispose of any waste on a public highway, street, road, recreational area or in any public place except in a designated waste receptacle'

Sections 4 (2) and 6 explain that the waste generator must collect, segregate (hazardous waste from non-hazardous) and dispose waste in such a facility that shall be provided by the relevant local authority.

Section 5 provides methods of cleaner production (so as to minimize waste generation) which includes the improvement of production processes through: conserving raw materials and energy.

Waste management has been identified as a major problem in most construction projects. The seawall project will definitely produce waste from construction process.

3.5.2 EMCA (Water Quality) Regulations, 2006

These are described in Legal Notice No. 120 of the Kenya Gazette Supplement No. 68 of September 2006. These Regulations apply to drinking water, water used for agricultural purposes, water used for recreational purposes, water used for fisheries and wildlife and water used for any other purposes. This includes the following.

- Protection of sources of water for domestic use;
- Water for industrial use and effluent discharge;
- Water for agricultural use.

These Regulations outline:

- Quality standards for sources of domestic water;
- Quality monitoring for sources of domestic water;
- Standards for effluent discharge into the environment;
- Monitoring guide for discharge into the environment;
- Standards for effluent discharge into public sewers;
- Monitoring for discharge of treated effluent into the environment

The contractor will be required to adhere to these regulations as well as regulations during construction.

Parameter	**Max Allowable (Limits)**
1,1,1-trichloroethane (mg/l)	3
1,1,2-trichloethane (mg/l)	0.06
1,1-dichloroethylene	0.2
1,2-dichloroethane	0.04
1,3-dichloropropene (mg/l)	0.02
Alkyl Mercury compounds	Nd
Ammonia, ammonium compounds, NO3 compounds and NO2 compounds (Sum total of ammonia-N times 4 plus nitrate-N and Nitrite-N) (mg/l)	100
Arsenic (mg/l)	0.02
Arsenic and its compounds (mg/l)	0.1
Benzene (mg/l)	0.1
Biochemical Oxygen Demand (BOD 5days at 20 oC) (mg/l)	30
Boron (mg/l)	1.0
Boron and its compounds – non marine (mg/l)	10
Boron and its compounds –marine (mg/l)	30
Cadmium (mg/l)	0.01
Cadmium and its compounds (mg/l)	0.1
Carbon tetrachloride	0.02
Chemical Oxygen Demand (COD (mg/l)	50
Chromium VI (mg/l)	0.05
Chloride (mg/l)	250
Chlorine free residue	0.10
Chromium total	2
cis –1,2- dichloro ethylene	0.4
Copper (mg/l)	1.0
Dichloromethane (mg/l)	0.2

Dissolved iron (mg/l)	10
Dissolved Manganese(mg/l)	10
E. coli (Counts / 100 ml)	Nil
Fluoride (mg/l)	1.5
Fluoride and its compounds (marine and non-marine) (mg/l)	8
Lead (mg/l)	0.01
Lead and its compounds (mg/l)	0.1
n-Hexane extracts (animal and vegetable fats) (mg/l)	30
n-Hexane extracts (mineral oil) (mg/l)	5
Oil and grease	Nil
Organo-Phosphorus compounds (parathion, methyl parathion, methyl demeton and Ethyl parantrophenyl phenylphosphorothroate, EPN only) (mg/l)	1.0
Polychlorinated biphenyls, PCBs (mg/l)	0.003
pH (Hydrogen ion activity----marine)	5.0 – 9.0
pH (Hydrogen ion activity--non marine)	6.5 – 8.5
Phenols (mg/l)	0.001
Selenium (mg/l)	0.01
Parameter	Max Allowable
Selenium and its compounds (mg/l)	0.1
Hexavalent Chromium VI compounds (mg/l)	0.5
Sulphide (mg/l)	0.1
Simazine (mg/l)	0.03
Total Suspended Solids, (mg/l)	30
Tetrachloroethylene (mg/l)	0.1
Thiobencarb (mg/l)	0.1
Temperature (in degrees celious) based on ambient temperature	± 3
Thiram (mg/l)	0.06
Total coliforms (counts /100 ml)	30
Total Cyanogen (mg/l)	Nd
Total Nickel (mg/l)	0.3
Total Dissolved solids (mg/l)	1,200
Color in Hazen Units (H.U)	15
Detergents (mg/l)	Nil
Total mercury (mg/l)	0.005
Trichloroethylene (mg/l)	0.3
Zinc (mg/l)	0.5
Whole effluent toxicity	
Total Phosphorus (mg/l)	2
Total Nitrogen (mg/l)	2

Table 5: The EMCA Water Quality Standards for Effluent Discharge into the Environment

3.5.3 EMCA (Controlled Substances) Regulations, 2007

These regulations aim to regulate the production, trade and use of controlled substances and products and provide for a system of data collection to facilitate compliance. The regulations call for promoting the use of ozone friendly substances and products, equipment and technology to ensure that products used do not deplete the ozone layer.

3.5.4 EMCA (Wetlands, River Banks, Lake Shores and Sea Shore Management) Regulations, 2009

These Regulations, made under the Environmental Management and Co-ordination Act, 1999, make provision for the management, conservation and sustainable use of wetlands and wetland resources and the sustainable utilization and conservation of (resources on) river banks, lake shores, and the seashore. The Regulations, among other things, set out general conservation and management principles, define duties of the Standards and Enforcement Review Committee and County Environment Committees in respect of wetlands, shores and banks.

The Proponent shall comply with the provisions of the Act in protecting the shoreline, preventing and controlling pollution and siltation in rivers by pre-treating water before disposal into the water bodies.

It states in section III part 17 that Environmental impact assessment as required under the Act shall be mandatory for all major activities on river banks, lake shores and the seashore.

3.5.5 EMCA (Fossil Fuel Emission Control) Regulations, 2006

These regulations are described in Legal Notice No. 131 of the Kenya Gazette Supplement no. 74, October 2006.The regulations include internal combustion engine emission standards, emission inspections, the power of emission inspectors, fuel catalysts, licensing to treat fuel, cost of clearing pollution and partnerships to control fossil fuel emissions. The fossil fuels considered are petrol, diesel, fuel oils and kerosene.

3.5.6 EMCA (Air Quality), Regulations, 2014

The Kenyan Air Quality Standards as part of *The Environmental Management and Co-ordination Act 1999*, were transposed into Kenyan legislation through *The Environmental Management and Co- ordination (Air Quality) Regulations, 2014.* As previously mentioned, these standards include a consideration of the type of area within which the proposed project is located – i.e. industrial area, residential area and controlled area. For the purposes of the air quality assessment for the proposed seawall, it is assumed that the residential and/or controlled area standards will apply along the whole alignment of the proposed seawall, whichever are most stringent. Controlled areas are stated to include, but are not limited to, residential areas, hospitals, National Parks, Reserves and Sanctuaries and therefore this approach is considered to be appropriate for the seawall construction assessment. This assumption is reasonable, as the large majority of receptors identified along the route are residential properties, with two marine protected areas and reserves on the route.

Kenyan Standards		
Pollutant	**Averaging period**	**Criterion (µg/m^3)**
NO2	annual average	96
NO2	monthly average	153
NO2	24 hour maximum	100
NO2	one hour maximum	383
NO2	Instant peak maximum	957
PM10	annual average	50

PM10	24 hour 98 percentile	70
PM2.5	annual average	35
PM2.5	24 hour maximum	75

Table 6: Kenyan air quality standard

3.5.7 Noise and Excessive Vibration Pollution Control Regulations, 2009

Part II section 3(I) of these Regulations states that: no person shall make or cause to be made any loud, unreasonable, unnecessary or unusual noise which annoys, disturbs, injures or endangers the comfort, repose, health or safety of others and the environment and section 3(2) states that in determining whether noise is loud, unreasonable, unnecessary or unusual, the following factors may be considered:

- Time of the day;
- Proximity to residential area;
- Whether the noise is recurrent, intermittent or constant;
- The level and intensity of the noise;
- Whether the noise has been enhanced in level or range by any type of electronic or mechanical means; and,
- Whether the noise can be controlled without much effort or expense to the person making the noise.

Part III, Section 11(1) states that any person wishing to (a) operate or repair any machinery, motor vehicle, construction equipment or other equipment, pump, fan, air-conditioning apparatus or similar mechanical device; or (b) engage in any commercial or industrial activity, which is likely to emit noise or excessive vibrations shall carry out the activity or activities within the relevant levels prescribed in the First Schedule to these Regulations. Any person who contravenes this Regulation commits an offence.

Zone	**Description of Noise Receptor**	**Permissible Noise Level in dB(A)**	
		Day (06:01 – 20:00, LAeq, 14 hour)	Night (20:01 – 06:00, LAeq 10 hour)
A	Silent zone1	40	35
B	Places of worship	40	35
C	Residential: Indoor Residential: Outdoor	45 50	35 35
D	Mixed residential (with some commercial and places of entertainment)	55	35
E	Predominantly heavy industrial areas	60	35

Table 7: Classification of Permissible Noise Levels in Different Receptor Zones

The table below presents the maximum permissible LAeq levels for construction sites in Kenya (Second Schedule). The Kenya noise regulations define daytime period as 06:01 to 18:00 hours and night-time period from 16:01 to 06:00 hours.

Table 8: Facility Based Classification of Permissible Noise Level in dB(A)

	Facility	**Maximum Permissible Noise Level in dB(A)**	
		Day (06:01 – 18:00, LAeq, 12	**Night (16:01 – 06:00, LAeq 12 hour)**
(i)	Health facilities, educational institutions, homes for disable etc.	60	35
(ii)	Residential	60	35
(iii)	Areas other than those prescribed in (i) and (ii)	75	65

Kenya also has permissible noise levels (in maximum C-weighted decibels or dBCmax) for mines and quarries (Third Schedule); however, the dBCmax limits refer to noise overpressure due to blasting (i.e. air blast overpressure).

Compliance with this limit can be met through appropriate consideration of the blasting design. In addition, the Kenyan EMCA regulations state "*The relevant lead agency shall ensure that mines and quarries, where explosives and machinery are used, are located in designated areas, and not less than two kilometers away from human settlements.*"

During the construction of the proposed projects some form of vibration and noise is expected, and mitigation measures are proposed in the ESIA report.

3.6 National Museums and Heritage Act (2006)

The National Museums and Heritage Act of 2006 consolidated the law relating to national museums and heritage. It provides for unfettered protection of heritage. The Act recognizes the role of the local community in participating fully in the planning and implementing the conservation of the heritage sites. Further, the Act allows the National Museums of Kenya to possess the monument if the guardian contravenes the authorities conferred to them by the Act. It also identifies the local authorities where the monument is situated as the institution that should carry out the daily management of the monuments. The counties use Public Health Act (Cap 242) (Republic of Kenya 1986), Building Code (Republic of Kenya 1987), Physical Planning Act (Cap 286) (Republic of Kenya 1996), the Urban Areas and Cities Act (Acts No. 13) (Republic of Kenya 2011), to plan, control and maintain the monuments. They enforce any applicable by-laws or Acts during the conservation period of the monument. Construction at the site, of any kind, must be approved by the respective county and the National Museums of Kenya. It is the set of legal provisions used to gazette the Vasco Da Gama pillar as a national monument.

In defining the functions of The National Museums, the act states that it shall;

a. serve as national repositories for things of scientific, cultural, technological and human interest;
b. serve as places where research and dissemination of knowledge in all fields of scientific, cultural, technological and human interest may be undertaken;
c. identify, protect, conserve and transmit the cultural and natural heritage of Kenya; and
d. promote cultural resources in the context of social and economic development.

3.7 Wildlife Management and Coordination Act 2013

The Wildlife Conservation and Management Act, 2013 is the main statute governing all wildlife resources, and its main aim is to improve the protection, conservation, sustainable use and management of wildlife resources. The Act revises the Wildlife (Conservation and Management) Act of 1976, and brings wildlife legislation into compliance with the Constitution. Principles of the Act: devolution, effective public participation, ecosystem approach, recognition of wildlife conservation and management as a form of land use on public, community and private land, self-sustainability (benefits from wildlife offset costs), sustainable utilization and equitable benefit sharing.

The main implementing body for the Act is the Kenya Wildlife Service (KWS), which is charged with managing and conserving wildlife resources within National parks, wildlife conservation areas and sanctuaries in Kenya. The institution is also responsible for protecting forests within its jurisdiction and supporting the conservation, rehabilitation and protection of forests and water catchments that are significant wildlife habitats. The KWS gets funding from national budgetary allocations, investments by the service, loans, donations and revenue from joint partnerships on bio prospecting.

The Wildlife Act provides restructured governance of wildlife resources in accordance with the Constitution of Kenya, 2010. Specifically, County governments have a role through the management of national reserves (Section 35) and the County Wildlife Conservation and Compensation Committees (Section 18). These committees are required under the law to establish wildlife user rights, oversee implementation of management plans on community and private lands, oversee equitable benefit sharing of wildlife resources and review compensation claims.

The Wildlife Act provides for the protection of wetlands and marine areas that are important habitats or ecosystems for wildlife conservation (Section 33 and 36). These include mangrove forests in the coastal region of Kenya. It also provides restrictions for pollution of wildlife habitats and ecosystems (Section 89). The law sets out stiffer fines and punishments for offenders. In addition to any sentence imposed, a polluter may also be required to pay the full cost of cleaning up the polluted wildlife habitat and ecosystem (Section 89, 2).

In implementing the seawall project, it is on record that the pillar stands next to the Malindi Marine Protected Area. KWS is expected to intervene in case of any infringements such as pollution of the sea during construction.

3.8 Fisheries Management and Development Act

This Act provides with respect to a wide range of matters concerning the fisheries sector including fisheries management and conservation, aquaculture and fish processing and marketing. It establishes the Kenya

Fisheries Advisory Council ("Council"), The Kenya Fisheries Service ("Service"), The Fish Marketing Authority ("Authority"), the Fisheries Research and Development Fund and the Fish Levy Trust Fund. The Act also implements obligations under international law concerning fisheries. The objective of this Act is to protect, manage, use and develop the aquatic resources in a manner which is consistent with ecologically sustainable development, to uplift the living standards of the fishing communities and to introduce fishing to traditionally non-fishing communities and to enhance food security.

Guiding principles of the Act include, among other things, conservation and protection of fisheries habitats, ensuring the effective application of the ecosystem approach to fisheries management and that biodiversity and genetic diversity in the marine environment is maintained and enhanced, encouraging the participation of users of the fisheries resources, and the general community, in the management of fisheries, application of the precautionary approach to the management and development of the fisheries at no less standard than is set out in any international agreement.

The Service is established as a body corporate and shall be responsible for the conservation, management and development of Kenya's fisheries resources. There is established within the Service a Monitoring, Control and Surveillance Unit (MCS). The Cabinet Secretary may make regulations control and establishing and assigning functions to an inter-agency unit. monitoring control and surveillance unit. The object of the Fish Levy Trust Fund shall be to fund activities geared towards management, development and capacity building, awards and urgent mitigation to ensure sustainability of the fisheries resource. The Director-General of the Service (DG) may, in consultation with County governments, other appropriate agencies and other departments of Government, establish fisheries development measures and, in the Gazette, give notice of any international conservation and management measures recognized by Kenya for the purposes of this Act. Contravention of international measures of foreign vessels shall be notified to flag States and RFMO's and the DG may request immediate investigations by the flag State, notify the flag state of the presence of the vessels in a Kenyan port and take additional measures in conformity with international law, including such measures as the flag State of the vessel has expressly requested or to which it has consented and any measures agreed through the relevant regional fisheries management organization.

Each County may develop fisheries management measures and plans for fisheries resources within its jurisdiction. Each fisheries management plan developed by each County shall take into consideration, to the extent possible, elements of a fisheries management plan made under this Act for a designated fishery and recommendations of the DG. The Cabinet Secretary responsible for fisheries may, for purposes of ensuring structured community participation in fisheries management, make Regulations regarding the management of beach management units established by county governments. The DG may, with approval of the Cabinet Secretary impose specified measures for the conservation and management of any fishery. The Cabinet Secretary may establish Marine Protected Areas and may declare any species of fish to be endangered or threatened with extinction and such fish may not be caught or processed. He or she may also establish:

a) fish landing stations,
b) designated fishing ports, and
c) protected fish breeding grounds. Fishing for marine mammals is prohibited.

The Act furthermore provides with respect to, among other things: introduction of live fish in Kenya fishery waters, prohibition to pollute Kenyan waters, periodic stock assessment of all the fishery waters, fish quality and safety, an aquaculture development plan, the prohibition to deprive community of traditional access to fisheries, transboundary aquaculture ecosystems, licensing of (semi)industrial fishing vessels, terms and conditions for license or authorization granted under this Act, compliance with standards relating to work conditions on board fishing vessels, registration of artisanal fishing vessels, recreational fishing, transshipment of fish, deployment of fish aggregating devices, fish processing licenses, monitoring, reporting and record keeping, (denial of) port access, inspection for foreign vessels and other measures to combat IUU fishing, vessel monitoring systems, and functions of Fish Marketing Authority.

The Vasco Da Gama pillar is within the confines of the Shela BMU established under this act. Fishermen therefore are key stakeholders in the deliberating any interventions of the pillar.

3.9 The County Government Act

There is constitutional provision for county governments who may appoint urban boards, and the respective principal laws are the County Governments Act 2012 and the Urban Areas and Cities Act 2011. The 47 county governments are responsible for collecting taxes, user fees and charges and, in addition, Article 203(2) of the constitution stipulates that not less than 15% of revenue raised nationally must be allocated to county governments. County governments also receive revenue from central government block grants through the Local Authorities Transfer Fund (LATF). The county governments have been assigned 14 functions under the fourth schedule of the constitution, including agriculture, county health and transport services, trade and tourism development and county planning. Relevant to the proposed protection seawall at Vasco Da Gama pillar is the cultural activities, public entertainment and public amenities function. Among those listed is museums, sports and cultural activities and facilities, and county parks, beaches and recreation facilities.

County government consists of a county assembly and a county executive. The county assembly is composed of: a member elected by voters from each ward; a number of special seats nominated by political parties to ensure that no more than two-thirds of the assembly comprises one gender; members of marginalized groups including people with disabilities and youth, nominated by political parties; and a speaker. The county executive comprises the county governor, deputy county governor and members appointed by the county governor with the approval of the assembly sub-counties.

3.10 The Forest Management and Development

The Forest Conservation and Management Act of 2016 was enacted to give effect to Article 69 of the Constitution which obliges The State to ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources. Enforcing the Act is the result of a move to protect the country's forests by curbing deforestation and forest degradation. The tremendous deterioration of forests became a cause for concern because of the extent of damage to the country's eco-system. Section 7 of the Act establishes the Kenya Forest Service to conserve, protect and manage all public forests. However, they face several challenges, the main one being the conversion of forestland into agriculture and settlement.

Currently, Kenya has a forest cover of 7.24% which is less than the 10 percent minimum required by Article 69(1)(b) of the Constitution and the United Nations. This has raised serious concerns about the management of Kenya's forests and their need to be addressed. While a lot of rural land is forest, it can be made into farmland and human habitable areas. Forests conversion involves the removing of natural forests to meet other land needs, such as plantation of agriculture, pasture for cattle, human settlement and mining. This process is usually irreversible. The causes of forest conversion and other forest crimes are complex. It is partly poverty driven but also associated with commercial exploitation of timber which also undermines ongoing efforts to curb deforestation and the enhancement of carbon stocks to mitigate climate change.

These laws are to benefit the country by penalizing offences and prohibiting activities outlined in Part IX of the Act. Section 64 states these offences and they include, felling, cutting, taking, burning or removing any forest produce. It is also an offence to clear, cultivate or break up land for cultivation or for any other purpose. In addition, setting fire to, or assisting any person to set fire not any grass or undergrowth or any forest produce is punishable and is liable on conviction to a term not exceeding one hundred thousand shillings or to imprisonment for a term not exceeding six months, or to both.

The purpose of this Act is to promote sustainable management of forest resources with a view to promote and to secure biological diversity, consideration for the landscape, outdoor recreation and the cultural values associated with the forest. In the implementation of the project, a few trees will be felled to gain access to the site and this act will be followed in processing approvals for the same.

3.11 The Water Act

In 2002 the Kenyan Government launched a new Water Act in which local authorities were required to form autonomous water and sewerage companies with independent Water Boards of Directors to provide water supply services. The local authorities were required to reinvest financial returns acquired from water supply services into service delivery. Another important feature of the 2002 Act was the encouragement of a "bottom-up approach" that emphasized the role and active participation of local communities in the decision-making process and implementation of local water projects.

When Kenya changed its Constitution in 2010, there was a need to update and change the 2002 Water Act. The Constitution of 2010 changed Kenya's political governance into two tiers comprising of one central national government and 47 decentralized county governments. The year 2016 marked the time when the constitutional arrangements of the political governance were to take full effect. In October 2016, a new Water Act 2016 was gazetted (Government of Kenya, 2016). The Act states that its fundamental purpose is "to provide for the regulation, management and development of water resources, water supply and sewerage services, and related purposes" (Kenya Water Act, 2016). The Act recognizes that the responsibility for the provision of water related functions is a shared obligation between the national government and decentralized county governments and gives priority to the use of water for home consumption over irrigation and other purposes. Its launch has spurred a number of tensions and controversies within Kenya's administration of justice. The Council of Governors, have moved to court with a desire to stop the implementation of the new Act, arguing that it is "unconstitutional", as it omits county

(local) governments from decision making and creates a centralized framework for provision and regulation of water services (Construction Review Online, 2016).

In Section 77, the Act provides the county governments with the mandate to provide water and sanitation services as well as to develop the county waterworks. To exercise this mandate, the county governments are instructed to establish Water Services Providers, which are supposed to be commercially managed and licensed by the Water Services Regulatory Board (WASREB). Furthermore, in Section 68, the Act provides for the establishment of the Water Works Development Agencies (WWDA)12 whose primary responsibility is to develop "national public works" assets (water assets of national and strategic importance and cross-county water assets) that should be later handed over to the Water Service Providers managed by the county governments. These assets include water storage and water works for bulk distribution of water services. According to the Act the WWDA are also supposed to: provide technical services and capacity building to such county governments and water services providers within its area as may be requested.

Malindi Water & Sewerage Company Limited (MAWASCO) was established under this Act. Its shareholding is currently under the County Government of Kilifi. It started its operations on 1st February 2006.Its mandate is to provide cost effective and affordable quality water & sanitation services for Malindi residents.

3.12 The Occupational Safety and Health Act, 2007 (No. 15 of 2007) and Regulations

This Act replaced the Factories Act (Cap 514). It provides for the safety, health and welfare of workers and all persons lawfully present at workplaces, and provides for the establishment of the National Council for Occupational Safety and Health and for connected purposes.

There are several regulations under this Act and the most important to note is the 'Building Operations and Works of Engineering Construction Rules'. This will apply during the construction of the proposed projects in the proposed seawall. The rules are summarized below:

Table 9: Minimum Health and Safety Requirements for Civil Works

Legal Requirements	Description
General Requirements	
Notice of particular works/operations	Notice should be sent in writing to the Occupational Health and Safety Officer, not later than seven days after commencement of construction and building works except where the construction works will be complete in less than six weeks or notice had already been given to the Occupational Health and Safety Officer (Section 60 of the Act).
General Register	A general register of every person undertaking building operations or construction works be kept in adherence to the prescribed form L.D.B.C.R.2. This register is kept at the site of operations or at the office of the person undertaking the operations or works.
Special rules and welfares	Printed copies or prescribed abstracts of the Factories and Other Places of Work Act must be kept posted at the site of operations or works (Section 61 of the Factories and Other Places of Work Act) and OSHA.
Safety Requirements	
Air receivers	These should be of sound construction and be properly maintained. They should be thoroughly examined by a competent person at intervals of 24 months and the reports of such examinations attached to the General Register (Section 39of the Factories and other Places of Work Act) and OSHA.
Cylinders for compressed, liquefied and dissolved gases	Such cylinders should be of good construction, sound material, adequate strength and free from patent defect. The cylinders should conform to standards specified under the Standards Act or to a prescribed standard specification, approved in writing, by the Director, Kenya Bureau of Standards. They should be thoroughly examined by a competent person at regular intervals and a maintenance register kept (Section 39A of the amendment of the Factories and Other Places of Work Act) and OSHA.
Notification of accidents	The particulars of an accident causing death or disablement of a worker for more than three days from earning full wages at the work place where he was employed must be sent in the prescribed form (L.D.B.C.R 6) to the Occupational Health and Safety Officer and entered in the General Register. Certain dangerous occurrences must also be reported whether or not they cause disablement (Section 62 of the Factories and Other Places of Work Act) and OSHA.

Health Requirements	
Sanitary accommodation	Sufficient and suitable sanitary conveniences must be available for persons employed. These must be kept clean and well lit (Sections 16 and 18 of the Factories and Other Places of Work Act) and OSHA.
Miscellaneous Requirements	
Prohibition of deduction from wages	The occupier must not make a deduction from wages in respect of anything he has to do or provide in pursuance of the Factories Act or permit any person in his employment to receive payment from other employees for such services (Section 66 of the Factories and Other Places of Work Act) and OSHA.
Duties of persons employed	An employee must not wilfully interfere with or misuse any means, appliance, convenience or other thing provided in pursuance of the Act for securing health, safety or welfare provided for his use under the Act. He must not wilfully and without reasonable cause do anything likely to endanger himself or others (Section 65 of the Factories and Other Places of Work Act) and OSHA.
Inspection	The Occupational Health and Safety Officer has the power to inspect every part of the premises by day or by night. He may require the production of registers, certificates and other papers. May examine any person alone or in the presence of any other person as he thinks fit and may require him to sign a declaration of truth of the matters about which he is examined. Every person obstructing an Occupational Health and Safety Officer is liable to a penalty (Section 69 of the Factories and Other Places of Work Act) and OSHA.

3.13 Labor Institutions Act

The Labor Institutions establish institutions and bodies involved in the administration of management of labor relations. It provides for the functions, powers and duties, and other related matters relevant with labor. The Act establishes and strengthens institutions, which deal with labor administration and management of labor relations.

Since labor constitutes a large part of the construction process this legislation is relevant to the project.

3.14 Public Health Act

The Public Health Act (PHA), the primary legislation applicable to matters of public health crises, authorizes public health authorities, particularly the Minister of Health, to take various actions during public health

crises, including declaring an infectious disease a "notifiable infectious disease" or a "formidable epidemic, endemic or infectious disease," and taking the necessary prevention and suppression measures to fight the disease. Specific powers accorded to health authorities for the purpose of prevention and suppression of an infectious disease include search, seizure, and detention powers; the power to designate any place as a quarantine area, including ships and aircraft; and the power to restrict or ban immigration into the country.

Kenyan and international laws impose certain transparency requirements on the country's government. Chief among these are the requirement under the PHA to periodically publish information regarding infectious diseases in Kenya, neighboring countries, and around the world, and the obligation under the International Health Regulations to report any public health emergency to the World Health Organization (WHO).

During the COVID-19 pandemic the Cabinet Secretary for Health exercised the powers conferred by Section 36 of the Public Health Act and Rule 3 of the Public Health to restrict of movement of persons in Kilifi County and related measures rules 2020.

3.15 The Physical and Land Use Planning Act

The new Physical and Land Use Planning Act, 2019 (the 2019 Planning Act) came into force on 5 August 2019, repealing the Physical Planning Act of 1996 (the 1996 Act). The 2019 Planning Act shall now govern matters relating to planning, use, regulation and development of land in Kenya.

Some of the changes introduced by the 2019 Planning Act include;

- Increased public participation: Members of the public will now be given the opportunity to give their views and raise objections to various matters e.g. the suitability of the national and county plans.
- Classification of developments: Developments are no longer classified as either Class "A" or Class "B" but rather the 2019 Planning Act lists developments that require development permission. In this regard, developments such as subdivision, amalgamation, change of user, extension of user, extension of lease and approval of building plans will still require development permission to be issued by the relevant county government.
- Additional developments requiring approvals: Processing of easements and wayleaves will now require express development permission, as will siting of educational institutions, base transmission stations, petrol stations, eco lodges, campsites, power generation plants and factories.
- Definition of commercial and industrial use: There is also more clarity as to what constitutes a commercial use versus an industrial use. This will guide applicants in selecting the correct land use, depending on the nature of the project they wish to undertake.
- Pre-requisite for other licenses: Development permission in respect of commercial and industrial use is a pre-requisite for other licensing authorities granting a license for a commercial or industrial use, or occupation of land.

The 2019 Planning Act has also set timelines in relation to various matters, significantly:

- 6 years: The maximum time a person shall serve as Director General of Physical and Land Use Planning.

- 3 years: Period within which to commence a project before the development permission lapses.
- 2 years: Period within which the national plan should be completed.
- 90 days: Time allowed for land to be restored by the developer where development permission was not sought in advance, failing which the county shall restore the land at the cost of such developer.
- 60 days: If an applicant does not receive a response to their application for development permission after this period, such application will be deemed to have been approved.
- Every 10 years: Counties are required to prepare their respective county plans.

3.16 Kenya Maritime Authority Act

Kenya Maritime Authority is a statutory authority established under the Kenya Maritime Act 2006, (KMA Act). KMA's Mandate is to Regulate, coordinate and oversee Maritime affairs in the Republic of Kenya. Other principal functions include:

- Administer and enforce the provisions of the Merchant Shipping Act, 2009, Regulations, International Maritime Conventions, Treaties, Agreements and any other Instruments relating to the Maritime Sector for the time being in force;
- Advise government on legislative and other measures necessary for the implementation of relevant international conventions, treaties, and agreements to which Kenya is a party;
- Undertake and co-ordinate research, investigation, and surveys in the maritime field discharge flag State and port State responsibilities in an efficient and effective manner having regard to international maritime conventions, treaties, agreements and other instruments to which Kenya is a party;
- Develop, co-ordinate and manage a national oil spill contingency plan for both coastal and inland waters and shall in the discharge of this responsibility be designated as the "competent oil spill authority;
- Maintain and administer a ship register;
- Deal with matters pertaining to maritime search and rescue and coordinate the activities of the Kenya Ports Authority, the Kenya Navy and any other body engaged during search and rescue operations;
- Enforce safety of shipping, including compliance with construction regulations, maintenance of safety standards and safety navigation rules;
- Oversee matters pertaining to the training, recruitment and welfare of seafarers;
- Plan, monitor and evaluate training programmes to ensure conformity with standards laid down in international maritime conventions;
- Conduct investigations into maritime casualties including wreck.

Kenya Maritime Authority is charged with the responsibility of regulating, coordinating and overseeing maritime affairs. In fulfilling this mandate KMA is expected to:

- Advise the government on the development of international maritime conventions, treaties and agreements as well as their codification into the laws of Kenya;
- Conduct and liaise with other stakeholders in doing research, investigations and surveys relating to maritime affairs;

- Develop and maintain the national oil spill response plan in coastal and inland waterways in liaison with players in the oil industry;
- Serve as coordinators of search and rescue operations in liaison with KPA, Kenya Navy and other relevant bodies;
- Ensure sustainable exploitation of marine resources and rapid response to marine calamities;

KMA therefore provides a forum for which the various players involved in maritime affairs develop maritime policies and integrate these policies into the national development plan.

Kenya is governed by the provisions of The International Convention for the Prevention of Pollution from Ships, 1973 (MARPOL 73/78) to which Kenya ascribes. This is the most important instrument for preventing pollution from arising from marine transportation. It was adopted in 1973 and modified by the Protocol of 1978 relating thereto, hence MARPOL 73/78. It consists of five Annexes as follows:

Annex I:	Oil - Ships are prohibited to discharge oil or oily water, such as dirty ballast water and oily bilge water containing more than 15 ppm of oil, within 12 miles of land. Other conditions apply to discharges outside 12-mile limits.
Annex II:	Noxious Liquid Substances in Bulk - Chemicals are evaluated for the environmental hazard they may cause if discharged into the sea (Categories A, B, C and D). Discharge into the sea of the most harmful chemicals (Category A) is prohibited and tank washings and other residues of less harmful substances (Categories B, C and D) may only be discharged under certain conditions, e.g., total quantity, distance from the shore, depth of water, prescribed depending on the hazards. There are substances, e.g., water, wine, acetone, ethyl alcohol, for which no restrictions apply.
Annex III:	Harmful substances in packaged form - this is principally oriented towards prevention of pollution by regulating packaging, marking and labeling and stowage.
Annex IV:	Sewage - It is prohibited to discharge ship-generated sewage unless it is treated with an approved sewage treatment plant or at a certain distance from land.
Annex V:	Garbage: - Garbage produced on board a ship, food waste, packaging, etc., must be kept on board and discharged either ashore or into the sea under certain conditions, such as the distance from land. Discharge of all plastics is prohibited.

Table 10: MARPOL 73/78 Annexes

Maritime operations are also regulated by London Convention, 1972 which prohibits dumping of garbage at sea.

Part of the heritage identified in this project are ship wrecks whose safety is covered under KMA laws. In case of any oil spill into the sea, KMA would be directly be responsible for the response process as it is competent oil spill authority.

3.17 Multilateral Environmental Agreements

Multilateral Environmental Agreements are internationally negotiated and agreed upon environmental governance instruments and treaties. They are vital in the general environmental protection, conservation and management especially in the face of environmental challenges against the backdrop of globalization. These challenges include: uncontrolled growth in the context of inadequate governance; competitiveness problems; rising energy demand and climate change; the spread of invasive alien species; the spread of consumerism and cultural diversity loss; and concentration of power, information and financial resources and enhancing communication possibilities. MEAs are thus important in strengthening international environmental governance (IEG). According to the NEMA website (https://meas.nema.go.ke/), Kenya is a signatory to the 4 Multilateral Environmental Agreements (MEAs) namely;

- United Nations Convention on Biological Diversity (UNCBD),
- United Nations Framework Convention on Climate Change (UNFCCC),
- United Nations Convention on Combating Desertification (UNCCD),
- Stockholm Convention on Persistent Organic Pollutants (POPs).

The agreements were formulated by the international community as part of the international effort to promote the concept of sustainable development. Below is a comprehensive list of agreements signed by Kenya.

Name of Convention	Focus Area	National Focal Institution
African Convention on the Conservation of Nature and Natural Resources, 1968(as revised in 2003)	Natural Resource Convention	Kenya Wildlife Service
Convention on Wetlands (Ramsar convention)1971	wetlands	Kenya wildlife service
UNESCO Convention Concerning the Protection of the World Culture and Natural heritage (1972)	Culture and Heritage	National Museums of Kenya
Washington Convention on International Trade in Endangered Species (CITES, 1973)	Trade	Kenya Wildlife Service
Bonn Convention on the Conservation of Migratory Species of Wild Animals (CMS 1979)	Wildlife	Kenya Wildlife Service
UN Convention on the Law of the Sea (UNCLOS,1982)	Oceans Governance	Attorney General's Office
London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972) Protocol to the Convention on Prevention of	Dumping at Sea	Ministry of Transport
Pollution from Ships, as amended in 1978(MARPOL 1973/78)	Pollution	Transport

International Convention on Oil Pollution Preparedness, Response and Cooperation (1990)	Oil Pollution at Sea	Ministry of Transport
Convention for the Protection, Management and Development of the Marine and Coastal Environment of the East African Region with its Protocols (Nairobi Convention,1985)	Costal and Marine Conservation	National Environmental Management Authority (NEMA)
Vienna Convention for the Protection of The Ozone Layer Supplemented by the 1987 Montreal Protocol on Substances That Deplete the Ozone Layer (1985)	Ozone Layer Protection	Ministry of Environment and National Resources
Basel Convention on the Control of Tran boundary Movement of Hazardous Wastes and Their Disposal (1989)	Hazardous Waste	Ministry of Environment and National Resources
Bamako Convention on the Ban of the import into Africa and the Control of Tran boundary Movement and Management of Hazardous Wastes within Africa (1991)	Hazardous Waste	Ministry of Environment and National Resources
Convention on Biological Diversity (1992)	Biodiversity	Ministry of Environment and Mineral Resources
United Nations Framework Convention on Climate Change (UNFCCC,1992)	Climate Change	Ministry of Environment and Natural Resources
United Nations Convention to Combat Desertification (UNCCD,1994)	Desertification	Ministry of Environment and Natural Resources
Stockholm Convention on Persistent Organic Pollutants (POPS, 2001)	Chemicals	Ministry of Environment and Natural Resources
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998)	Chemicals	Ministry of Environment and Natural Resources
Global Programme of Action for the Protection of the Marine Environment from Land Based Activities (1995)	Marine Environment	NEMA

Table 11: Major Multilateral Environmental Agreements Signed by Kenya

NMK is listed as the focal institution in of charge culture and heritage under the UNESCO Convention Concerning the Protection of the World Culture and Natural heritage (1972).

3.18 Institutional Mandates and Project Relevance (KWS, NEMA, KMFRI, NMK, CDA, TOURISM, County, KEFRI, KFS)

Table 12: Project Relevant Institutions and Mandates

Institution	Role	Relevant to Project	
		Yes	No
NEMA	Environmental Compliance	☒	☐
NMK	Heritage Management	☒	☐
KWS	Marine Park/Reserve Management	☒	☐
Fisheries	Fisheries Management	☒	☐
KMFRI	Marine Research	☒	☐
County Government	County oversight and management	☒	☐
KFS	Forest Management	☐	☒
WRMA	Water Resources Management	☐	☒
KMA	Maritime Issue	☒	☐

The Kilifi County government and NMK are the key institutions in implementing this project.

4.0 ENVIRONMENTAL BASELINE INFORMATION

4.1 Landscape, Topography and Geology

The landscape in northern Kenyan coast (i.e., Malindi) is predominant low-laying and can be categorized into 3 units, namely:

i. The beach characterized by rock/reef cliff, sandy soil and unstable dune formation (see photo below)
ii. The coral landscape consists of higher situated old reefs. It is characterized by depression with clayish soils and area susceptible to water logging.
iii. The plateau is a prominent area of shallow sandy clay soils underlain by coral limestone rock.

Figure 10: A map of Kenyan coastal geology and topology, B. view of rocky shore along the Vasco Da Gama in Malindi.

The project site is exposed rock coast where the cliffs are of raised fossil reef limestone that are similar to Mozambican sedimentary rock systems majorly composed of limestone, siltstones, shales and sandstone. The site is located on a flat coastal plain. It is also possible that the site is comprised of younger sedimentary rocks of the pleistocene age that are made up of coral reefs, sandstone, and sands of marine origin.

4.2 Climate

The project area is located within the western Indian Ocean monsoon climate region, experiencing the southeast and northeast monsoon conditions all year round (SEM and NEM, respectively). The SEM runs from late April to October and is rougher, with strong winds from the southeast bringing heavy wave energy and rain storms in towards Malindi coastal areas. The NEM blows from December to late March and is

calmer, with drier wins from the northeast and more favorable condition for marine engineering works on the water. The monthly mean wind direction in the strong south East Monsoon (SEM) is between 145° and 200°, with a mean direction of 164°, with mean velocity of 6 ms-1, reaching maximum value of 14.6 ms-1 (Anon 1975, Nguli 2006). Between the two seasons there are calm doldrums conditions lasting approximately 4 weeks, but precise timing varies from year to year. Heavy rainfall and worst conditions for massive marine works such as sea wall constructions are in late April to August.

4.3 Temperatures and Rainfall

An average annual temperature ranges from 22.3°C to 26.6°C in the coastal lowlands, while the hinterland temperatures range from 30°C to 34°C. An average temperatures ranges from 21°C in July to 24°C in August. The rainfall pattern has two distinct seasons; the long rains which occur between the months of March to June, with 60% reliability; and the short rains which start towards the end of October lasting until December or January. The month of May and June has the highest precipitation with a mean monthly rainfall of about 375.44 mm, although these long rainfalls decrease gradually after June.

4.4 Oceanographic conditions

The physical marine environment within the project area can be classified as water with strong influence of coastal currents. Coastal currents, waves and wind may have a strong influence on benthic characteristics and sediment transport. The inshore water includes water in the lagoons which extends landward to the shallow narrow creeks and estuaries reaches. Water in these shallow areas are considerable influenced by the river and the land runoff. The main river of importance is River Sabaki with freshwater input that creates estuarine conditions in the project area.

4.4.1 Coastal Currents and surface transport

Currents in the project area dominated by separate offshore and inshore coastal processes. Offshore currents are dominated by the East African Coastal Current (EACC) formed by the northward deflection of the South Equatorial Current when it hit the African mainland in southern Tanzania and northern Mozambique. The EACC flows northwards throughout the year, accelerated during the SEM when reinforced by the prevailing wind to speeds of 0.5-0.75m/s, and slower during the NEM when the monsoon winds blow counter to the current, at speed of < 0.25 m/s.

Water movement within inshore reef lagoons and fore reefs waters are strongly influenced by tidal flushing patterns, and tend to flow with prevailing winds rather than the offshore EACC. At the inshore channels, maximum current speed of approximately 1 m/s can occur, with ebb current tending to be slightly stronger than flood currents. In addition to causing currents, the winds blowing over the water surface exert a shear stress resulting in a surface transport of water. In general, oceanic currents are not considered significant direct contributors to physical shoreline changes. However, they do influence the dispersion of sediment plumes generated from underwater engineering works.

4.4.2 Waves and wind conditions

Wave action is dependent on the direction of the local winds and also arise from swells, bottom friction and depth of water over the fringing reefs. Although waves in the near-shore areas are small, they last for a short period and at an increasing speed that get higher and finally breaks on reef edge. The largest waves reach a height of up to 2-3m during the SEM when the winds are strongest. Waves can propagate directly

from open sea to the fringing reef where waves first shoal and break on the reef edge and then propagate with new amplitude on the reef platform, beaches and reef cliffs where Vasco Da Gama pillar is located. SEM is the dominant season, hence influence the onshore and offshore drift as well as transport of sediment plumes.

4.4.3 Tides regimes

Kenyan coastal waters are characterized by semi-diurnal tides, having two high and two low waters per every 24-hour period or a day. Except for limited periods in the year, however, the levels of high and low water of each successive tide differ appreciably from the corresponding tide before and the tide following. Tidal amplitude varies from 1.5 m on neap tides to 4.0 on spring tides. The reference for tidal observations is in Malindi port where the tidal range does not usually exceed 3.0m. Tidal range in this project area is 2.0 m for neap tide and 2.9 m for spring tide. Deviations from the predictions in the tide tables are influenced by barometric pressure, monsoon winds and oceanic swells. However, the lowest tides occur persistently during the northeast Monsoon as they combine with the prevailing winds to drive water offshore.

4.5 Coastal and marine Habitats and Biodiversity

New structures in the coastal and marine environment have the potential to cause fundamental changes in the physical habitats and their associated biodiversity. There are four major or important coastal and marine environment that are present along Kenyan coast, namely coral reefs, seagrass beds, intertidal flats and mangroves that form an interdependent continuum. Other minor nearshore habitats include sand bottom, sandy beaches and rocky shores.

4.5.1 Coral reefs

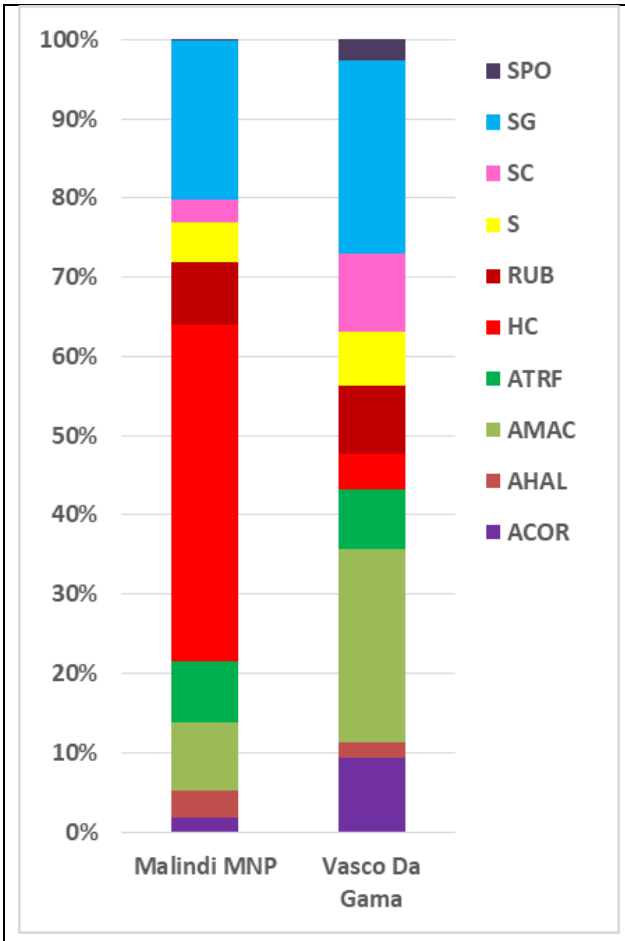
Coral reefs are one of the most diverse and biological productive habitats found along the Kenyan. The reefs contain diverse marine life, many of them occurring in protected areas. About 140 species of soft and hard corals have been identified with diversity and extend decreasing northwards toward Somalia. They are important habitat in that they form breeding and sheltering grounds for various marine life, as well as serve as barrier to the coastline and, residential and cultural properties against strong waves. Additionally, the coral reefs are of great importance in supporting fishing, tourisms and bioprospecting industries, hence have a high value to many stakeholders including artisanal and commercial fishers. Despite their many ecological and socio-economic importance, the Kenyan reefs, just like other parts of the region are facing a number of challenges experienced both at local and global scales (Obura et al 2017; Gudka et al 2018). In absence of environment conscious policies, increased anthropogenic and natural threats can represent potentially serious risks to the coastal ecosystems.

In front of the project site, the intertidal area is highly dominated by seagrass covering nearly 60% of the benthos found in calm sheltered waters < 3m deep. Abiotic structure dominated the benthic environment; 49% of comprised rubble, sand/silt 12%, and dead reef/coral (9%). Biotic structure included macrolgae /Sargassum (25%) and live coral (4%).

Near the reef crest higher wave energy have created a mixed habitat of seagrass and rubble and occasional coral colonies (14% of area) and in deeper channels (3-10m) sandy carbonate deposits dominant the benthos (26%).

The benthic environment is strongly influenced by inflow of freshwater and sediment inputs from the River Sabaki. As a result, the coral reefs at this area are highly impacted by siltation/sedimentation and poor water quality from nearby Malindi town, and hence the area is not designated as of high priority for conservation. On most of the shallow areas, there is evidence of heavy sedimentation that have resulted to predominance of rocky reef with macroalgae (30 %) of intertidal and subtidal areas. On top of the reef crest and down the slope there is evidence of high sediment movement due to strong northward moving currents and high ocean waves.

Along the beach edge (<1m depth), there are numerous tide-pool patches that are characterized by sandy and rubble substrata with extensive seagrass and macroalgae growth (Fig.10). The fish population on the patch reef is very low and are observed to be mainly of small sizes and representing only few species (Fig. 10). Most of the observed fish sizes were smaller (<15) with little or no top predators (groupers, snappers) seen.



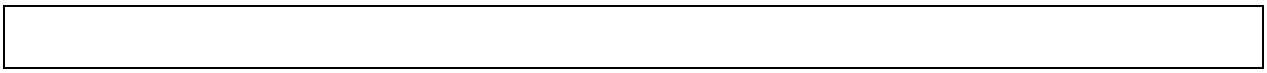


Figure 11:A view of benthic habitats between Malindi Marine Park and Vasco Da Gama nearshore site.

The project site is adjacent to Malindi MNPR that has been well studied and documented to have moderate biodiversity compared to reserve section and other unprotected areas. The patch reefs immediately within the lagoon are the primary areas of vibrant coral growth and biodiversity in the Malindi MNPR. The most highly developed patch reef grows out of channels 4-5 m deep, with high and dense coral cover (>35-60%) of large massive corals (*Galaxea astreata*, *Porites*). Patch reefs in shallow environment (< 2m) are characterized by smaller corals and higher species diversity, and reduced coral cover (11-20%). Typical benthic cover on the patch reef is shown in fig. 10 with percent cover of the main substrate types on the left) showing that they are very different with patch reef in front of the project area. These patch reefs have a high diversity of corals, with>105 species from 46 genera recorded. The most highly developed coral reef is found in southern end of Kenya, in Kisite MNPR, with about 131 coral species recorded (Obura 2017).

Most coral genera were also found on the reef, but 13 genera were observed in the rocky intertidal (tidal pool) zone, with 2 of these (*Anomastrea irregularis* and *Alveopora)* only observed in this habitat

Further, the patch reefs in Malindi MNP has highest richness for fish observed of all the habitats. Though not documented from the data collected, Malindi MNPR has been reported as part of the home-range for dolphin species, sea turtles, dugongs and blue whales (KWS 2016).

4.5.2 Seagrass

Seagrass beds are highly productive components of coastal ecosystems that cover wide expanses of the intertidal and subtidal zones. Extensive seagrass beds occur in Malindi, Ungwana-bay and Watamu along coastal shores extending from 0 to 10 m depth. Seagrass beds are highly diverse array of flora and fauna dependent on sandy and rocky substrates and light availability in shallow environment. They are the main substrate cover in the shallow waters to deeper locations in the lagoon ranging between 2-8m of the intertidal (Fig. 10). The dominant seagrass species is *Thalassodendron ciliatum*, which provides shelter and food for a variety of herbivorous fish (e.g., rabbitfish, surgeon and parrotfish) and invertebrates. The other species also found particularly in shallower sections (i.e., rocky pools, sandy areas, soft substrate on the beach), including *Halodule*, *Cymodocea*, and *Syringodium*. This study has also shown that they are other many species such as turtle and dugongs that are known to graze directly on seagrass further emphasizing the importance of seagrass habitat in the area.

Much of the artisanal fishery depends on fish that feed and or live permanently in seagrass beds, and many of the fishing methods are adapted for use in seagrass beds (basket trap, nets and Uzio).

Seagrass beds are subject to frequent disturbances, anthropogenic and natural, that have led to alterations in their abundance. Sedimentation and eutrophication have been recorded to lead to the decimation of large areas of seagrass beds. However, the main threat in Kenya has been explosions of sea urchins that have occurred in the past as a result of overfishing of trigger fish that controls sea urchins' populations through predator-prey balances.

4.5.3 Muddy and sandy substrate

While muddy habitats are not common along the Kenyan coast, sandy sub-tidal habitats dominate the shoreline of Kilifi county particularly along the Malindi-Ungwana Bay. These habitats dominate especially near the outflows of the River Sabaki. In addition, pockets of sandy and muddy habitats occur particularly in close association with seagrass and coral reefs. These habitats harbor high densities and diversity of macrofauna and meiofauna communities. Because of the high abundance of shrimps (prawns), these habitats support the commercial bottom trawl fishery along the Malindi-Ungwana bay.

4.5.4 Rocky cliff

Rocks in the upper part of the intertidal have a diverse assemblage of microbial and interstitial flora and fauna of chitons and some amphibian crustaceans.

4.5.5 Sandy beach

Most of the coastline areas are endowed with beautiful white sandy beaches, making it one of the most preferred tourist destinations. The sandy beaches are important recreational sites for the local tourists and provide alternative livelihood opportunities through provision of services. Sandy beaches are also important habitats for sea turtles, which lay their eggs in the upper section of beaches. Beaches are dynamic environments, constantly changing as a result of natural processes, including storms, tidal changes, and sea level rise.

4.5.6 Protected/endangered species

4.5.6.1 Sea turtles

Sea turtles are recognized as flagship species in the marine environment. They are widely distributed along the Kenyan coast in areas mainly associated with seagrass and coral reefs. Three sea turtle's species have commonly been cited laying eggs on the Kenyan beach-the hawksbill turtle (Eretmochyles imbricata), the green turtle (chelonian mydas) and the olive ridley turtle (Lepidochelys olivacea) (Okemwa et al 2004). They feed of seagrass beds found in the shallow lagoon to deep intertidal zones and lay eggs at the edges of the highest water tide mark on sandy beaches. Their population decline is mostly attributable to loss in foraging grounds (i.e., seagrass beds), pollution and modification of shoreline and nesting sandy beaches due to sea level changes (Okemwa et al 2004). All Indian ocean sea turtles are designated under the endangered Species Act (ESA) as either threatened or endangered.

4.5.6.2 Marine mammals

The project area is known for some marine mammals such as dolphins, sharks and humpback whales frequently cited offshore of the Malindi fringing reef and rarely inshore. As top-level predator, they impact on local food webs and ecosystems as a whole and serve as important indicators of the health of marine environments. They also indicate exposure and effects of pollutants over spatial, temporal and trophic scales.

4.5.7 Conservation status of biodiversity in the project area

Collective data from past survey indicate that there are 23 species within the Malindi NPR which have an IUCN red list status other than least concern (LC) or data deficient (DD), with five near threatened (NT) species. Amongst this list, ten species are classified as vulnerable (VU) or near threatened (NT) all of which are elasmobranch (sharks, rays, and guitarfish) and Serranidae (groupers).

Table 13: Endangered (EN) and critically endangered (CE) WIO species and their CITES listing.

Major taxa	Scientific name	Status	Common English name	CITES Appendix
	Acropora roseni	EN	Scleractinian hard coral	II
	Acropora rudis	EN	Scleractinian hard coral	II
	Anacropora spinosa	EN	Scleractinian hard coral	II
	Ctenella chagius	EN	Scleractinian hard coral	II
Corals	*Parasimplastrea sheppardi*	EN	Scleractinian hard coral	II
	Pocillopora fungiformis	EN	Scleractinian hard coral	II
	Stylophora madagascarensis	EN	Scleractinian hard coral	II
	Millepora tuberosa	EN	Hydrozoan fire coral	II
	Holothuria lessoni	EN	Golden sandfish	-
	Holothuria nobilis	EN	Black teatfish	-
Holothurians				
	Holothuria scabra	EN	Golden sandfish	-
	Thelenota ananas	EN	Prickly redfish	-
	Aetobatus flagellum	EN	Longheaded eagle ray	-
	Aetomylaeus vespertilio	EN	Reticulate eagle ray	-
	Electrolux addisoni	CE	Ornate electric sleeper ray	-
Rays	*Anoxypristis cuspidata*	EN	Narrow sawfish	I
	Pristis clavata	EN	Dwarf sawfish	I
	Pristis	CE	Largetooth sawfish	I
	Pristis zijsron	CE	Green/Narrowsnout	I
	Haploblepharus kistnasamyi	CE	Natal shyshark	-
	Holohalaelurus favus	EN	Honeycomb Izak, Natal Izak	-
Sharks	*Holohalaelurus punctatus*	EN	African Spotted catshark	-
	Sphyrna lewini	EN	Scalloped hammerhead	-
	Sphyrna mokarran	EN	Great hammerhead	-
	Latimeria chalumnae	CE	Coelacanth	I
	Argyrosomus hololepidotus	EN	Madagascar Kob	-
Fish				
	Cheilinus undulatus	EN	Humphead wrasse	II
	Thunnus maccoyii	CE	Southern Bluefin tuna	-
	Caretta caretta	EN	Loggerhead Ttrtle	I
	Chelonia mydas	EN	Green turtle	I
Turtles				
	Dermochelys coriacea	CE	Leatherback turtle (sub-pop)	I
	Eretmochelys imbricata	CE	Hawksbill turtle	I
Mammals	*Balaenoptera borealis* *Balaenoptera musculus* *Balaenoptera physalus*	EN EN EN	Sei whale Blue whale Fin whale	I I I

Table 14: View of Intertidal areas adjacent to the Vasco Da Gama pillar indicating the location of soft bottom, seagrass and sand beaches habitats

5.0 Socio-economic Baseline

5.1 Political and Administrative Arrangements

Kilifi has **seven** sub counties namely; Kilifi North, Kilifi South, Ganze, Malindi, Magarini, Rabai and Kaloleni. It has 35 wards, 54 locations, and 165 sub locations as shown in the table below.

Table 15: Kilifi County Administrative Units by Area

Sub County	Area (Km2)	No. of wards	No. of location	No. of Sub locations
Kilifi North	530.3	7	7	22
Kilifi South	400	5	7	16
Ganze	2,941.6	3	14	48
Malindi	627.2	5	8	18
Magarini	6,979.4	6	8	28
Kaloleni	686.4	4	11	21
Rabai	205.9	4	7	12
Total	**12,370.8**	**35**	**62**	**165**

(Source: Kilifi County Integrated Development Plan (CIDP) 2018-2022)

Malindi is the fourth largest sub-county with a total area of 627km^2. It has five wards and eight locations split into eighteen sub-locations

Table 16: Eligible and Registered Voters, by Constituency

Sub County	Eligible Voters, 2017	Registered voters, 2017	Registered voters as percentage of eligible voters
Kilifi North	107,844	101,978	94.56
Kilifi South	84,311	84,865	100.66
Ganze	58,258	54,760	94.00
Malindi	88,119	87,210	98.97
Magarini	69,693	68,453	98.22
Kaloleni	68,455	60,470	88.34
Rabai	53,635	50,332	93.84
Total	530,315	508,068	95.80

(Source: IEBC Kilifi Office, 2017)

From the table above it is that almost 99% residents of Malindi participate in electoral processes.

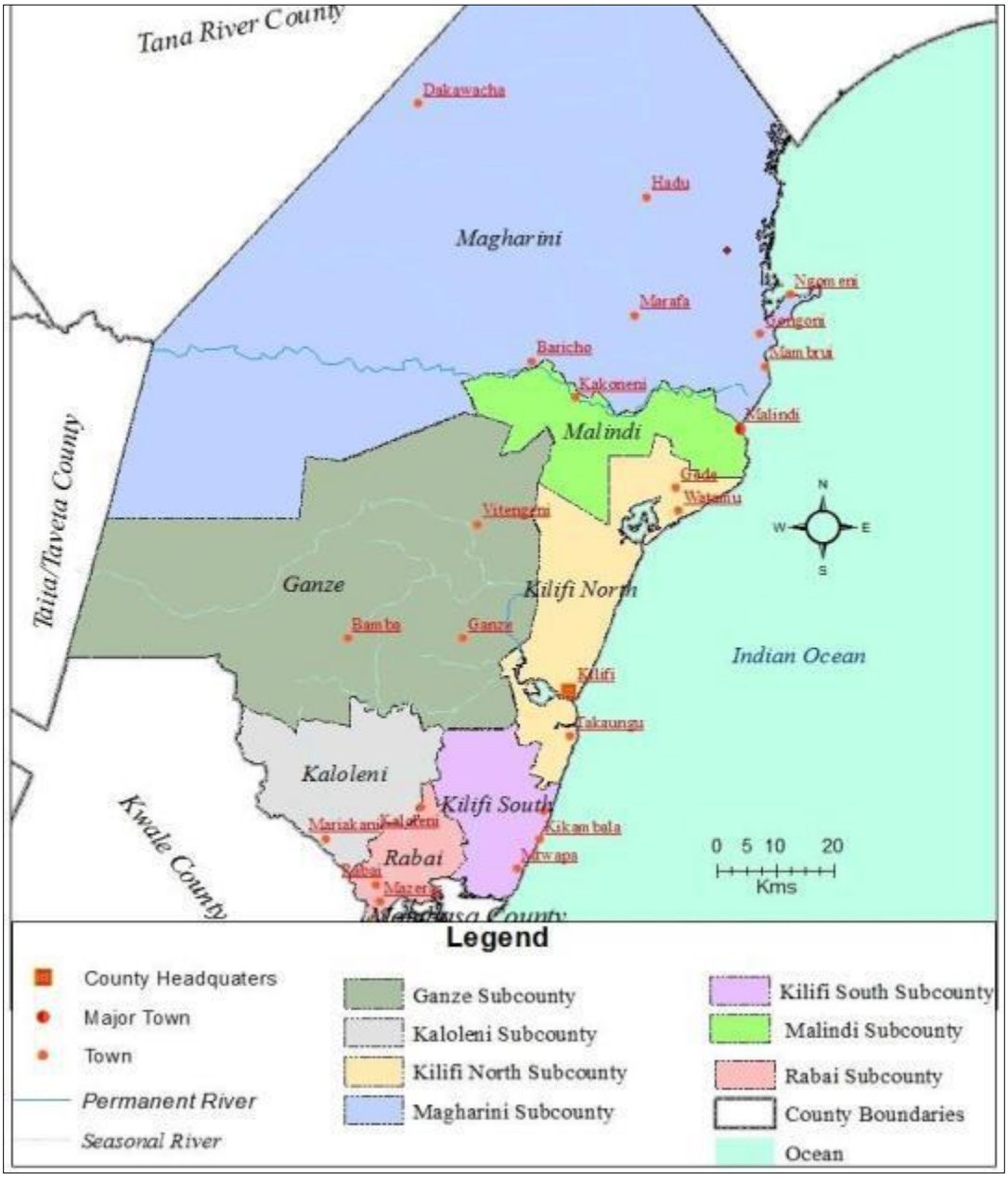


Figure 12: Map of Kilifi Sub counties

(Source: Kilifi ICDP 2018-2022)

5.2 Population and Demography

Kilifi county is predominantly inhabited by the Mijikenda community. Nevertheless, county residents constitute a representation of Kenya's forty-four (44) tribes and a small population of foreigners. The population of the county is estimated to be 1,498,647 in 2018 as projected from the Kenya Population and Housing Census of 2009, composed of 723,204 male and 775,443 Female. The population is projected to

rise to 1,591,901 (out of which 45% are male and 55% female) and 1,841,958 out of which 47.8% males and 52.2% females in 2020 and 2025, respectively, at a mean inter-censual annual growth rate of 3.05 percent. The males represent 46.5 percent while the females represent 53.6 percent of the total population indicating a male: female ratio of 1:1.15. The county's dependency ratio stands at 101.45 per cent.

The county's main urban centres are **Malindi**, Kilifi, Mtwapa, Kaloleni, Mazeras, Mariakani, Watamu, Magarini, Marereni, Majengo and Bamba. The county's urban population stands at 328,652 in 2018, constituting 36.8 percent of the total population. This proportion of urban population mirrors that of the country at 39 percent and that of Africa at 36 percent, which is projected to increase to 50% and 60% by 2030 and 2050, respectively. Unfortunately, the rapid growth is taking place without corresponding capacity of the city and Town planning and management institutions to guarantee sustainable urban livelihoods. This is evidenced by a myriad of environmental problems including the proliferation of slums, squatter settlements, incessant collapse of buildings, traffic congestion, competing land uses, ribbon pattern of development and urban sprawl.

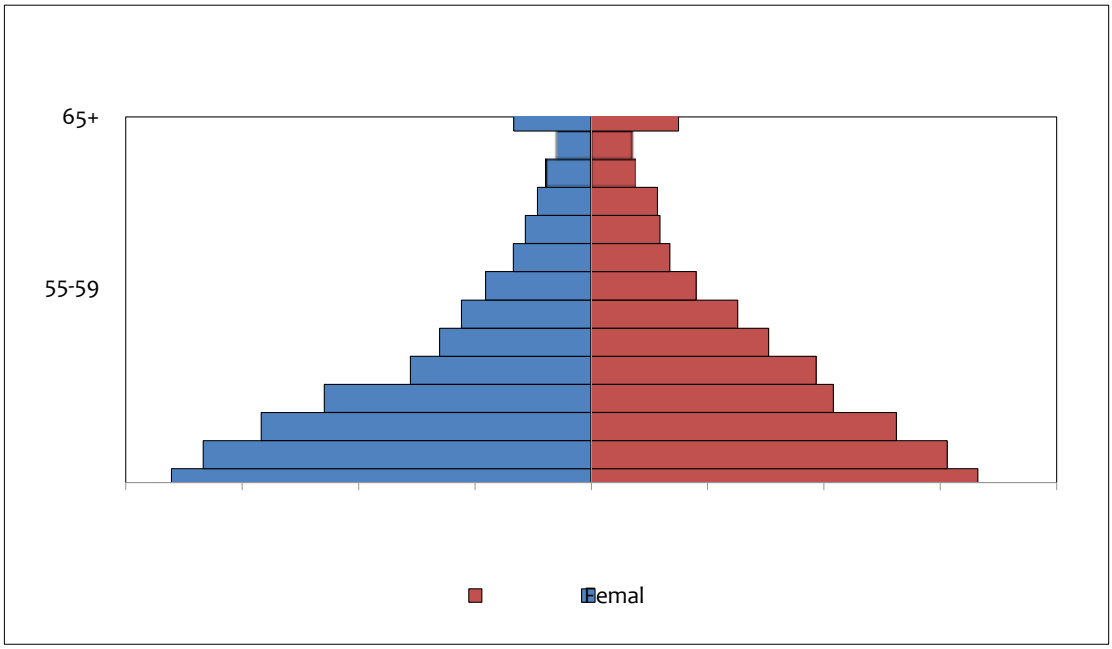


Figure 13: Kilifi Population Pyramid

Source: Kenya National Bureau of Statistics

Malindi is a cosmopolitan town. This has been discussed earlier in the report when giving a historical background of Malindi. The same still applies, it attracts person of diverse cultural backgrounds and has a large number of Italians who are involved in tourism and hospitality sector.

Table 17: Population Density and Distribution in the County

Sub County	Area (km²)	2009 (Census)		2018 (projection)		2020 (projection)		2022 (projection)	
		Population	Density (Persons /km²)	Population	Density (Persons /km²)	Population	Density (Persons /km²)	Population	Density (Persons /km²)
Kilifi North	530.30	207,587	391	280,337	529	297,698	561	316,135	596
Kilifi South	400.00	171,607	429	231,747	579	246,100	615	261,341	653
Ganze	2,941.60	137,664	47	185,909	63	197,422	67	209,649	71
Malindi	627.20	162,712	259	219,735	350	233,343	372	247,794	395
Magarini	6,979.40	177,241	25	239,356	34	254,179	36	269,921	39
Kaloleni	686.40	155,739	227	210,318	306	223,344	325	237,175	346
Rabai	205.90	97,185	472	131,244	637	139,372	677	148,003	719
Total	**12,370.80**	**1,109,735**	**90**	**1,498,647**	**121**	**1591458**	**129**	**1,690,018**	**137**
(Source: KNBS, 2017)									

Sub County	2009 Census			2018 (Projections)			2020 (Projections)			2022 (Projections)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Kilifi North	99,324	108,263	207,587	134,133	146,204	280,337	142,439	155,259	297,698	151,261	164,874	316,135
Kilifi South	82,109	89,498	171,607	110,884	120,863	231,747	117,752	128,348	246,100	125,044	136,297	261,341
Ganze	65,868	71,796	137,664	88,952	96,957	185,909	94,461	102,962	197,422	100,311	109,338	209,649
Malindi	77,853	84,859	162,712	105,137	114,598	219,735	111,648	121,695	233,343	118,562	129,232	247,794
Magarini	84,805	92,436	177,241	114,525	124,831	239,356	121,618	132,561	254,179	129,150	140,771	269,921
Kaloleni	74,516	81,223	155,739	100,630	109,688	210,318	106,863	116,481	223,344	113,481	123,695	237,175
Rabai	46,500	50,685	97,185	62,796	68,448	131,244	66,685	72,687	139,372	70,815	77,188	148,003
Total	530,975	578,760	1,109,735	717,058	781,589	1,498,647	761,465	829,993	1,591,458	808,623	881,395	1,690,018

Table 18:Population Projection by Sub County

(Source: KNBS Projections Kilifi County)

5.3 Health

Access to health services is described by the state of existing health facilities, health personnel and their distribution within the county. Kilifi County has a total of 1,426 health workers for all cadres. These include 15 Medical Specialists, 84 General practitioners (MOs), 561 Nurses, 110 Clinical officers, 90 public health officers among others. The department is largely understaffed. It has 5,129 medical and 828 non-medical staff, which translates into a total staffing gap of 5,957. The Doctor patient ratio is 1: 10,000 people while the Nurse patient ratio is 4 per 10,000 people. The average geographical distance to nearest the health facility (rural & urban) is 5km. The total Hospital Bed capacity is 492 distributed as follows: 184 beds for Kilifi County Hospital, 158 beds for Malindi Sub County hospital, 82 beds for Mariakani Sub County Hospital, 16 beds for Bamba Sub County Hospital and 22 beds for Jibana Sub County Hospital.

Table 19: Health Facilities by Ownership

Health facility type	Government sponsored	Faith Based Organization sponsored	Private	Total
Hospitals	5	2	3	10
H/Centre	14	0	4	18
Dispensary	123	11	9	143
Clinic/Nursing Home	1	0	119	120
Total No	**143**	**13**	**135**	**291**

(Source: Kenya Master Facility List (KMFL), 2018)

The five most common diseases in the County among children under five years in order of ranking are Upper Respiratory Tract Infections, Diarrhea, Diseases of the skin, Malaria and Pneumonia. On the other hand, Upper Respiratory Tract Infections (URTIs), Diseases of the skin, Malaria, Urinary Tract Infections (UTIs) and Diarrhea have high incidences among the general populations in the county. Malindi has developed a significant problem with illicit drugs, in particular heroin.

The County has considerable success for pregnant women attending first antenatal (mean of 85%) compared to fourth visit (mean of 39%) before and post devolution. There is a marked improvement after devolution but still more needs to be done. Some of the reasons for the poor performance includes; mothers starting clinics late and end up not completing the four ANC visits despite the efforts being put in place on health education.

Residents of Malindi utilize other small health facilities close to their localities but largely depend on the Malindi Sub County hospital for treatment.

5.4 Nutrition

The provision of proper nutrition especially to children under five is imperative for the health and wellbeing of the society. Good nutrition promotes health and reduces mortality especially among mothers and children. Poor nutrition during the first 1,000 days—from pregnancy through a child's second birthday—can cause life-long and irreversible damage, with consequences at the individual, community, county and national level.

The prevalence of stunting among children under five years stands at 39% in the county. Additionally, 4.7% and 18.2% of children under five years are wasted and underweight across the county. The key causes of malnutrition include sub-optimal maternal infant and young child nutrition and care practices, poor health seeking behavior and household food insecurity coupled with poverty.

There is need to strengthen the implementation of the High Impact Nutrition Interventions at health facility and community level, the county food and nutrition security multi-sectorial collaboration initiatives and advocacy for a strong political will to address malnutrition. Targeted hunger and social safety net programs for the vulnerable groups and integration of nutrition and school health program in all ECD centers will also go a long way in addressing malnutrition.

5.5 Water and Sanitation

In Malindi, Kenya's 10th largest urban area, only one-third of the population has access to safe water through a connection to the water network. The rest are forced to secure water from vendors – often at sharply inflated prices – or through illegal connections.

The region suffers from high levels of inequality, with a contrast between the luxury hotels close to the beach and impoverished low-income communities. The water network, which dates back to colonial times, faces numerous problems, such as pipelines made of asbestos and concrete that are prone to bursting.

Water supply is at present enough to meet the demand from existing customers, but the water system does not adequately cover the region. So, as the water network extends there will be a need to reduce water loss from leaking pipes and elsewhere.

Kilifi North constituency had the highest share of residents using improved sources of water at 90%. That is three times Magarini constituency has the lowest share using improved sources of water. Kilifi North constituency is 26 percentage points above the county average. Dabaso ward has the highest share of residents using improved sources of water at 90%. That is 99 percentage points above Mwanaminga ward, which has the lowest share using improved sources of water. Dabaso ward is 35 percentage points above the county average.

Malindi has no established sewer system but the water company is implementing projects that would increase coverage of areas with accessible piped tap water.

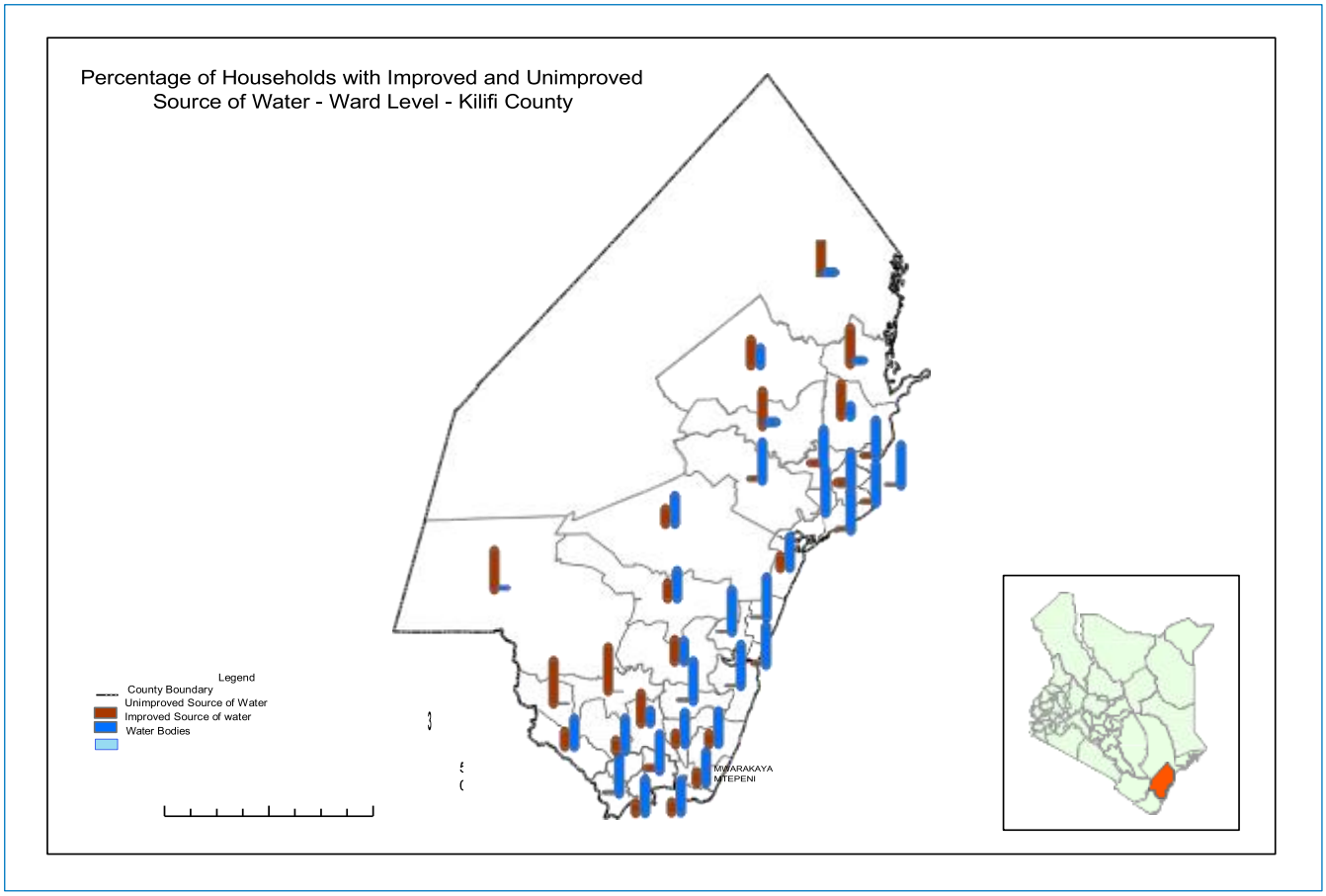


Figure 14: Water Level Scene in Kilifi County

Source: Kenya National Bureau of Statistics (KNBS)

A total of 42% of residents in Kilifi County use improved sanitation, while the rest use unimproved sanitation. There is no significant gender differential in use of improved sanitation with 42% of male headed households and 41% in female headed households using it.

Kilifi South constituency has the highest share of residents using improved sanitation at 69%. That is four times Magarini constituency, which has the lowest share using improved sanitation. Kilifi South constituency is 27 percentage points above the county average. Mwarakaya ward has the highest share of residents using improved sanitation at 86%. That is 14 times Bamba wards, which has the lowest share using improved sanitation. Mwarakaya ward is 44 percentage points above the county average.

Malindi does not have a sewerage network: therefore, all residents rely on onsite sanitation. The majority of low-income residents use and prefer water-based sanitation options, such as pour- or cistern-flush toilets. Most low-income areas have sandy soil, so pits are prone to collapsing. When pits are full, residents commonly rely on informal manual emptier.

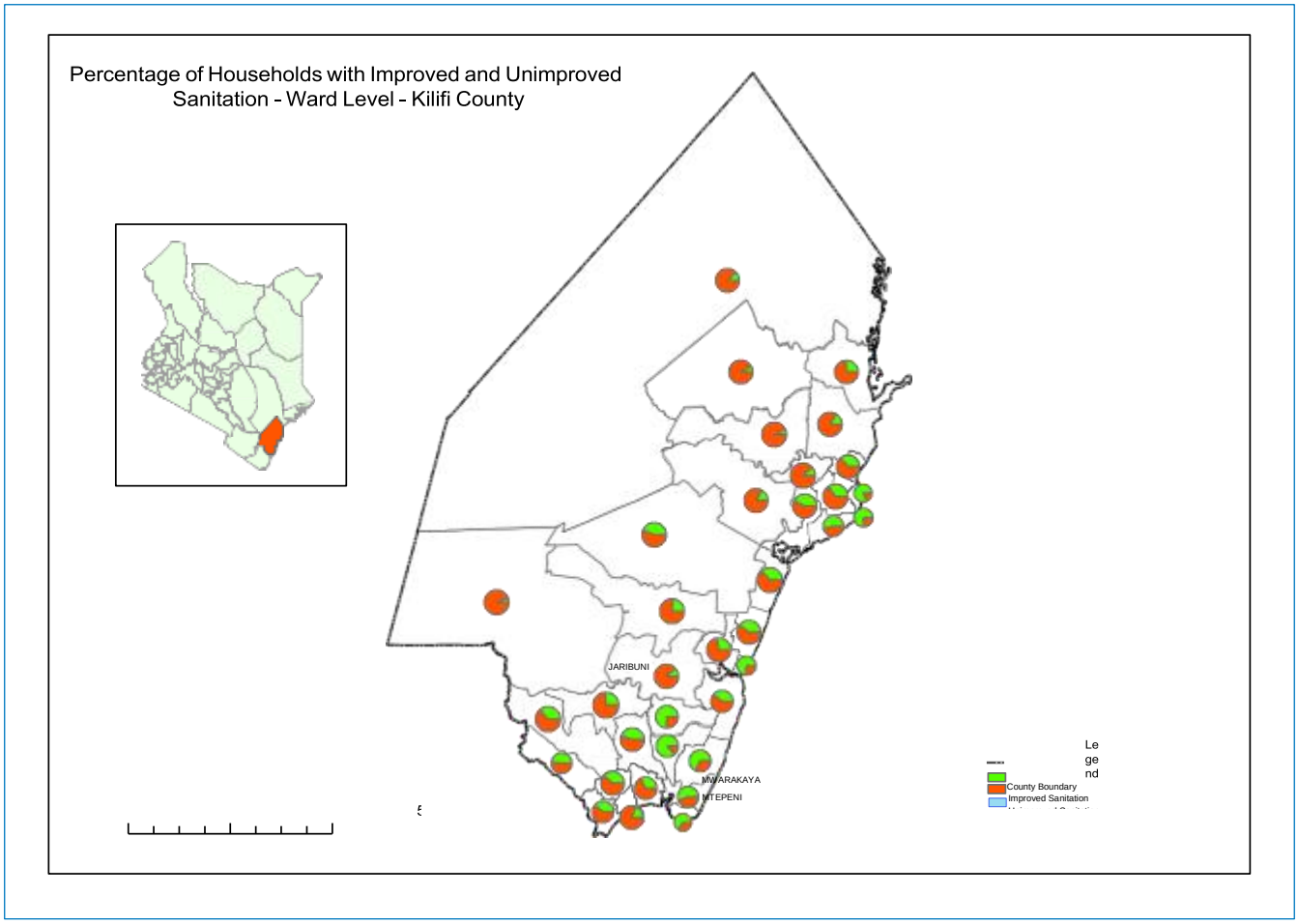


Figure 15: Sanitation in Kilifi County:

Source: Kenya National Bureau of Statistics (KNBS)

5.6 Culture and Heritage

The county is the home of a rich cultural heritage which includes Mnarani ruins consisting of two mosques and a group of tombs with the first mosque built in about 1425; Mnarani Ruins with two mosques where the second mosque built in about 1500. Also at the site of the ruins are the largest baobab trees on the Kenya coast, Mtwana heritage site dating back in 12th century with archaeological evidence indicating that the site developed prior to contact with the Middle and Far East and Jumba la Mtwana, a large house of the slave with four mosques, a tomb and four houses with recognizable condition. Malindi cultural heritage consists of classic Swahili architecture since it was a Swahili Settlement since the 14th century. Other Malindi-Sub-county cultural heritage includes; Gede Ruins, Mambrui town, Vasco Da Gama Pillar**,** Pillar Tombs. The Malindi Old Town, Hell's Kitchen, the Malindi Museum and the Portuguese Chapel.

National Monuments in Kilifi County

1. Takwa Milinga Ruins
2. District Officer's Office
3. Kaya Fungo

4. Kaya Kauma
5. Kaya Chivara
6. Khatib Mosque
7. Mambrui Pillar Tombs
8. Ngomeni Fort
9. Kibirikani Mosque
10. Portuguese Chapel etc.
11. Mnarani Ruins
12. Mtwapa
13. Mambrui
14. Takaungu South
15. Da Gama Pillar
16. Kilepwa Island
17. Jamadra Mosque
18. Sheikh Said
19. Sheikh Othman
20. Takaungu North
21. Jumaa Mtwapa
22. Mgangani
23. Gedi Ruins
24. Bedida Sacred Grove
25. Kaya Mudzi Muvya
26. Kaya Lunguma
27. Muyu wa Kae
28. Kaya Fimboni
29. Kaya Mzizima
30. Ronald Ngala's Site

5.7 Education and Literacy

The county has 799 public ECDE Centers with a total of 1723 teachers, 123 male and 1600 female. There are also 810 private Early Childhood Development Education Centers (ECDE) with a total of

1,513 teachers, 76 male and 1437 female. Gross enrolment at pre-school level stands at 135,571 pupils. Those in the public are 45445 boys and 44265 girls while those in the private are 22968 boys and 22813 girls. Transition Rate from pre-school to the next level is 45%, implying that an estimated 55% of the pupils don't proceed to primary education5. The teacher pupil ratio for those employed by the county is 1:130. Teacher pupil ratio considering those employed by parents is at 1:50.

Only 13% of Kilifi County residents have a secondary level of education or above. Malindi constituency has the highest share of residents with a secondary level of education or above at 18%. This is almost four times Ganze constituency, which has the lowest share of residents with a secondary level of education or above. Malindi constituency is 5 percentage points above the county average. Shimo la Tewa ward has the highest share of residents with a secondary level of education or above at 33%. This is eight times Bamba wards, which has the lowest share of residents with a secondary level of education or above. Shimo la Tewa ward is 20 percentage points above the county average.

Below are statics of Malindi Education Profile

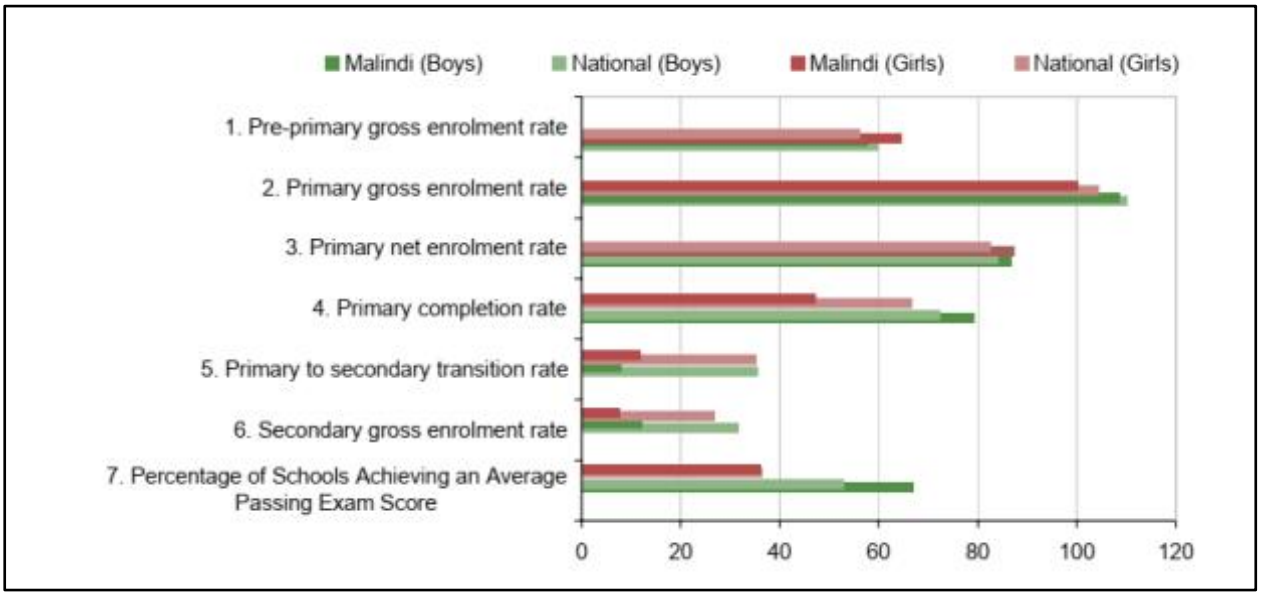


Figure 16: Malindi Education Profile

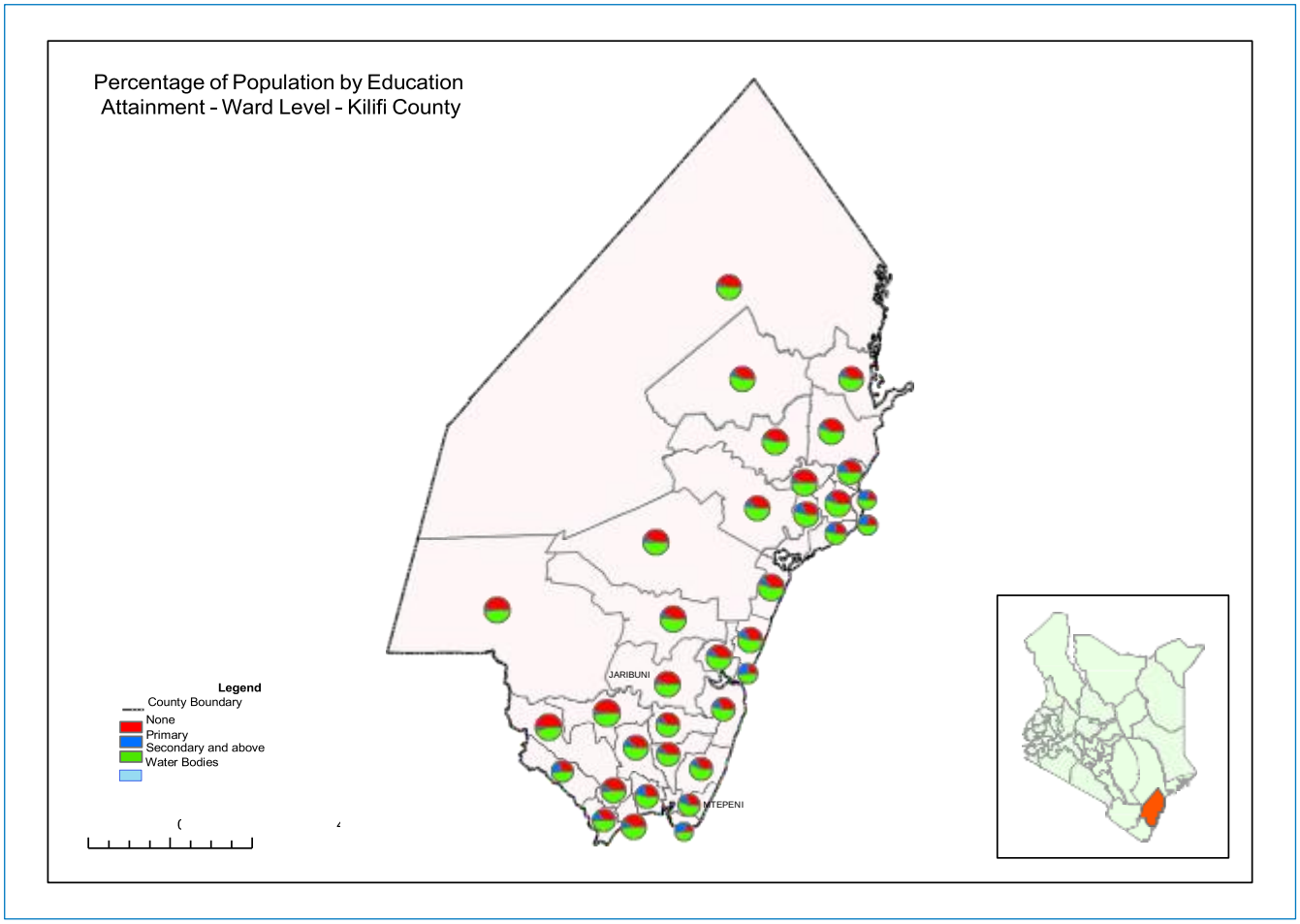


Figure 17: Level of Education in Kilifi County

Source: Kenya National Bureau of Statistics (KNBS)

A total of 52% of Kilifi County residents have a primary level of education only. Kilifi North constituency has the highest share of residents with a primary level of education only at 54%. This is 5 percentage points above Kaloleni constituency, which has the lowest share of residents with a primary level of education only. Kilifi North constituency is 2 percentage points above the county average. Junju ward has the highest share of residents with a primary level of education only at 57%. This is 11 percentage points above Kayafungo ward, which has the lowest share of residents with a primary level of education only. Junju ward is 5 percentage points above the county average.

Some 36% of Kilifi County residents have no formal education. Ganze constituency has the highest share of residents with no formal education at 45%. This is almost twice Malindi constituency, which has the lowest share of residents with no formal education. Ganze constituency is 9 percentage points above the county average. Kayafungo ward has the highest percentage of residents with no formal education at 50%. This is almost three times Shimo la Tewa wards, which has the lowest percentage of residents with no formal education. Kayafungo ward is 14 percentage points above the county average.

Pwani University is the only public university in the county with an enrolment of approximately 8,000. There are also campuses of four universities including MT Kenya University and Nairobi University, located in Malindi town, offering different market driven courses. Additionally, county has nine private accredited colleges; one middle level college (KMTC Kilifi) and 28 youth

polytechnics. These institutions offer youth a chance to further their skills to make them competitive in the labor market.

5.8 Law and Order

Kilifi County experiences a myriad of conflicts raging from intra-inter community conflicts, resource-based conflicts (largely land and extractive related) radicalization and Violence extremism, Gender-based and domestic violence among other conflicts. At community level, generational conflicts between youth and elderly have recently hit the county, with attacks targeted at elders over claims of witchcraft. Kilifi has also over the years experienced build-up tensions between perceived immigrants and natives with latent conflict therein. There have also been cases of electoral violence both at community and county level. The County seem to be a haven of Violent Extremism and radical groups recruitment and pockets of cells of organized criminal and outlawed groups (including terrorist groups). As such youth radicalization seems to be on the rise. The last terrorist attack in the County occurred in Kikambala in November 2002 but there exist cases of radicalization of youths in various areas notably Mariakani, Kikambala, Kilifi, Watamu, Malindi and Mambrui. The county is home to a total of 15 courts spread in 3 Sub-counties of Malindi, Kilifi and Kaloleni.

Type of Court	No. of Courts	Location of Court	Sub-county
Court of Appeal	1	Malindi Town	Malindi
High Court	1	Malindi Town	Malindi
Environment and Land Court	1	Malindi Town	Malindi
Industrial and Labor Relations Court	1	Malindi Town	Malindi
Chief Magistrates Court	1	Malindi Town	Malindi
Senior Principal Magistrates Court	1	Kilifi Town	Kilifi North
Principal Magistrates Court	1	Malindi Town	Malindi
Senior Resident Magistrates Court	4	Kaloleni, Mariakani Town, Kilifi Town & Malindi Town	Kaloleni, Kilifi North& Malindi
Resident Magistrates Court	2	Malindi Town and Mariakani Town	Malindi & Kaloleni
Kadhis Court	2	Kilifi Town & Malindi Town	Kilifi North& Malindi
Total	15		

Table 20: Kilifi Courts in Numbers *Source: Kilifi ICDP 2018 - 2022*

The Prison/ Correctional services have a total of 2 GK Prisons in Malindi and Kilifi. These facilities are spread in the 2 Sub-counties of Malindi and Kilifi North. Malindi Prison has a total of 323 officers (272 male and 51 female). There is a total of 19 Probation officers domiciled within 5 offices spread across 3 Sub counties of Kilifi, Kaloleni, and Malindi.

Malindi hosts nine of the fifteen courts available in Kilifi County.

5.9 Fisheries Sector

Fisheries sector has a potential to contribute significantly to the county's economy through employment creation, foreign exchange earnings, poverty reduction and food security support. This can be achieved through innovation, modernization and orientation towards commercialization in both aquaculture and capture fisheries. For instance, an average of 2,885 m tons of fish worth KShs.554 million land every year in the county. According to a recent Frame Survey, 2016, the county has a total of 4,713 artisanal fishermen operating along the county shoreline. The total number of fishing vessels is estimated at 1,057.

A myriad of marine fisheries activities is carried out within the county leading to the categorization of the following type of fishing detailed as follows:

6.9.1 Artisanal Fishery: It's mostly confined in the inshore and near shore areas especially due to the fishing gears and crafts used. This fishery supports over 4,000 fishermen ranging from foot fishers to those using motorized fishing boats with up to 5 nautical miles reach from the shore.

6.9.2 Sport Fishery: This is a major fishery in the county associated with gaming and tourism industry. The county has 4 active sport fishing facilities in Watamu, Malindi, Mtwapa and Kilifi that attract sport fishers from many countries who seasonally visit for the popular activity. It's a major boast to hospitality industry.

6.9.3 Marine Ornamental Fishery. Kenya exports up to 0.5M pieces of marine ornamental fishes' worth approximately KShs. 28million. Kilifi County contributes up to 50% of the sources of this marine ornamental fishery for export along the Kenya coast.

6.9.4 Semi Industrial and Industrial Fishery. Semi industrial prawn fishery is a species-specific fishery in the Malindi Ungwana Bay area involving medium size trawlers to fish for prawns. Every year, there are 4-5 semi commercial trawlers involved in Prawn fishery in the 3-5 nautical miles stretch along the Kilifi County shoreline in the Malindi Ungwana Bay. There are up to 7 semi commercial and industrial vessels operating in the EEZ from foreign countries fishing under licensing agreements with Kenya.

Fisheries activities are actively carried out during the Northeast Monsoon wind (Kasikazi) which starts from October to March each year. Low fish production is mainly realized during Southeast Monsoon Winds (Kusi) which fall within the months of April to September. The high demand of fish in the hotel industry has transformed fishing into a lucrative industry.

The county has over 7,000 fishermen distributed in different landing sites along the coastal line. The landing sites are under co-management of Beach Management Units (BMU). Kilifi South sub- county is represented by 3 landing sites including Mtwapa, Kanamai and Kuruwitu. Takaungu, Mnarani, Bofa,Wesa, Roka, Uyombo, Watamu falls under the jurisdiction of BMUs in Kilifi North Sub-county. Mayungu and Malindi are in Malindi sub-county with Ngomeni, Marereni and Fundissa under co-management of Beach Management Unit (BMU) in Magarini. Fishing of live fish in Kuruwitu, Kanamai, Mnarani, Kilifi, and Bofa fishing grounds are mainly done by Tropical sea harvest. While the market for fish is very huge in the coastal areas of Kenya, Table 19 below illustrates that there are very few fishermen and fisher fork in the county. Plenty of the fish and sea food consumed in the county is obtained from other areas.

Table 21: Major Landing Sites in the County

Name of Sub county	Name of landing site	Name of BMU	Fishermen/Fish traders
Kilifi South	Mtwapa	Mtwapa BMU	345
	Kanamai	Kanamai BMU	244
	Kuruwitu	Kuruwitu BMU	227
Kilifi North	Takaungu	Takaungu BMU	450
	Mnarani	Mnarani BMU	521
	Old Ferry-Kilifi	Kilifi Central BMU	656
	Bofa	Bofa BMU	615
	Wesa	Wesa BMU	480
	Roka	Roka BMU	155
	Uyombo	Uyombo BMU	460
Malindi	Watamu	Watamu BMU	515
	Mayungu	Mayungu BMU	430
	Malindi	Shella BMU	734
Magarini	Ngomeni	Ngomeni BMU	650
	Marereni	Marereni BMU	452
	Fundissa	Marereni BMU	350
Total			**7,284**

(Designated fish landing sites and their respective BMUs 2015)

Vasco Da Gama pillar stands at the edge of the Malindi Shela BMU fish landing site.

According to data from the department of fisheries, the total amount of fish production in 2017 in the county is as shown in Table 22

Table 22: Average Total County Fish Production from Marine Fisheries

Categories of fish	Type of fish	Five-year catch (Kgs)	Value, KShs
Demersal	Rabbit fish	177227	36708538
	Scavenger	222,356	25,688,681
	Snapper	195,265	35,317,011
	Parrot fish	107,244	17,162,831
	Surgeon fish	46,780	6,440,791
	Unicorn fish	51,414	6,815,753
	Grunter	26,515	5,598,302
	Pouter	28,659	5,218,625
	Black skin	45,583	8,327,285
	Goat fish	32,300	5,956,178
	Streaker	15,370	2,444,449
	Rock cod	84,638	16,740,885
	Cat fish	62,160	11,378,677
	Mixed demersal	216,594	28,003,630
	TOTAL	**1,312,105**	**11,801,635**
Pelagics	Cavalla jacks	90,460	17,391,029
	Mullets	36,647	7,270,336
	Little mackerels	122,209	19,423,558
	Barracudas	113,116	20,551,957
	Milk fish	29,622	5,552,965
	King fish	99,994	22,068,835
	Queen fish	46,903	8,979,834

	Sail fish	45,120	8,572,509
	Bonitos/Tunas	170,875	45,087,147
	Dolphins	17,962	3,558,447
	Mixed Pelagics	147,313	25,179,597
	TOTAL	**920,221**	**83,636,214**
	Sharks &Rays	138,333	23,121,981
	Sardines	51,059	7,609,037
	mixed fish/Others	21,562	8,427,036
Sharks and rays	**TOTAL**	**310,954**	**49,158,053**
	Lobsters	41,812	32,731,303
	Prawns	65,591	24,641,911
	Crabs	49,624	10,806,490
Crustaceans	**TOTAL**	**57,026**	**68,179,704**
	Oysters	23,423	4,913,299
	Beche-de-mer	9,252	1,462,997
	Octopus	125,257	27,806,888
	Squids	27,465	7,669,895
Others	**TOTAL**	**185,369**	**41,853,079**
Grand Total		**2,885,702**	**554,628,686**

Table 20 shows that fish landed in 2017 was 2,885,702 Kgs, translating to Kshs.554, 628,686 /= as household income. This signifies the vast potential in the sector, which exploitation has the capacity to sustain the livelihoods of the local communities and therefore contribute to poverty reduction and food security.

Malindi has a vibrant fishing sector. The Shela BMU has the highest number of registered fishermen in the county. All categories of fishing are carried out in Malindi. The Shela BMU is the home of most artisanal fishermen. Malindi Sea Fishing Club is regionally famous for its sport fishing enthusiast. The Ungwana Bay off the Malindi coastline is popular among trawlers. Several fishermen in Malindi are also involved in supplying ornamental fish to dealers countrywide.

5.10 Tourism

The County is rich in endemic flora and fauna, attractive physiographic features and tropical climate, and sites of historical importance that makes it a unique tourist destination. The County is endowed with sunny and sandy beaches, magnificent landscapes, tropical and marine forests and swamps that are home to endemic flora and fauna.

Further, the County has a rich cultural and historical heritage that includes Swahili/Arab and Mijikenda cultures, world heritage sites like the Kaya forests and archaeological monuments such as those in Gede, Malindi, Takaungu, Mnarani and Rabai, dating back to the slave trade period. The attractions include scenic views, recreational, cultural, historical, nature and shared experiences. Along its 265km shoreline, the County has unrivalled beach and marine-based recreational facilities. The long shoreline hosts innumerable marine sites that offer eco-tourism and water-sport attractions. They include the creeks at Mtwapa, Mida, Kilifi, Ngomeni and Fundisa bay. Malindi and Watamu Marine Parks are UNESCO designated biosphere reserves that are a critical habitat for some indigenous and migratory

bird species. They provide breeding and nursery grounds for various endemic fish species, marine turtles and several species of Crustaceans.

The county has over the years continued to be a gem of investment which continues to attract different investors with the Palm Exotic Hotel-an international brand being the latest having shown interest to open its doors in the region. The Vipingo Gold Club records being the first Golf club to be accredited international standard in East Africa under USGA in 2016. The upcoming Utalii College is expected to open a new frontier in the tourism sector, with the ongoing expansion of Malindi international airport and Mombasa Lamu road, deemed to open more opportunities. The Vipingo airstrip has opened doors for charter planes in the region with the recently launched standard gauge railway (SGR) supporting access to the destination. The opening of Mariakani- Kilifi road has equally eased transport with Bamba-Kilifi and Tsavo East National Park-Malindi road leveraging on infrastructure.

The town of Malindi is at the centre of a strip of idyllic tropical beaches offering the visitor a range of world class resorts and quiet relaxing hideaways. Northwest of Malindi is the spectacular Marafa Depression, locally known as 'Nyari' and popularly known as Hell's Kitchen. An extensive series of sandstone gorges and sheer gullies, this unique and otherworldly landscape has become part of local folklore.

The thick jungles of the Arabuko Sokoke Forest reserve hide a world of wonders. In the cool of the forest winding paths will take you in search of rare endemic birds and mammals, and visiting herds of Elephant. The forest holds another secret, the lost town of Gedi, a deserted trading Swahili town hidden deep in the forests, whose winding passages and crumbling walls tell of a long and mysterious past.

Other attractions in Malindi include a walk through the Forest, exploration the mangroves by boat, dive on the reef or try your hand at big game fishing. Malindi has all these choices to relax, unwind, and soak up the atmosphere.

Figure 18: Artwork Display in Malindi

5.11 Land Use

According to the Kilifi County Baseline Survey (2013) 65% of farm land was owned by household head or spouse, about 20% communally owned and 4% rented out by individual owners. 34% of households had title deeds to their land, 55% owned land without formal documents, 22% had communal rights to use of land and about 8% had use of land but never been allocated (squatter). This indicates that about 66% of all households did not have formal titles to the land and therefore could not use land as collateral to borrow loans or as incentive to undertake investments. Percentage of households with title deeds has, however, greatly improved since then, courtesy of the Government of Kenya's title issuance and settlement schemes acceleration program and County Government support of administration of new adjudication schemes. Between 2013 and 2017, 105,470 Ha of land in 35 adjudication sections were surveyed and demarcated, benefiting over 40, 000 households (Department of land, Housing, Energy, Physical planning, 2017)

Natural pastures occupy almost half of County farm lands, woodlots 7%, improved pasture/forage production 8%, homesteads 9%, subsistence crop production 21%, commercial crop production 1.5% and unusable land (swampy, rocky, hilly, etc.) 8%. Use of land that has not been allocated to current occupiers (squatters) in the County is not so much a landlessness problem as is a communal protest against historical land injustices associated with colonialism and delayed or skewed post-colonial state's implementation of land sector reforms. Kilifi, as are most coastal Counties, is still contending not only with the monumental ten-mile coastal strip land alienation problem but also the British Crown land legacy. These legally protected lands are at the core of the squatter problem in both the rural and urban areas of the County. While the Kenya Government, through the National Land Commission has in recent times been regularizing squatter settlement on the former British Crown land (that became state land after independence and now public land), formalizing squatter settlements in the privately registered land in the ten-mile coastal strip remains a thorny issue.

Delay in redressing the crown land legacy, which alienated vast areas of prime land for allocation to British subjects at the pleasure of their king/queen, has led to the squatter problem and what is now popularly known as 'land grabbing', the irregular alienation of public land to private 'developers'. The result of all this is growth of unplanned urban settlements, alienation of public utility spaces, dispossession and displacement of poor and vulnerable communities, increasing social inequalities and many other socio-economic problems. The County Government will, therefore, continue working with the national land commission and the land administration system in general towards formalization of all settlements, particularly of areas considered ancestral land by the occupiers.

5.12 Infrastructure Condition

Kilifi County has a road network of 101,000 km (out of which one (1) road is Class A Bitumen Trunk Road of 115.4Kms, one (1) Class A7 Bitumen National Road of 168.6 Kms, five (5) roads Class C Bitumen Primary Roads of 219.3 Kms, Class D gravel Secondary Roads and E earthen minor roads 3000Kms and the rest unclassified.

The county has about 40km of rail network, which is part of the Mombasa-Kisumu railway stretch that passes through the county between Mazeras and Samburu. There is one station in Mariakani and another railway terminus in the neighboring Mombasa County. Malindi Airport normally has up to four daily flights to Nairobi (from US$47 one way, one hour) with Airkenya, Fly540 and Fly-SAX (www.fly-sax.com), and a daily flight to Lamu (from US$59 one way, 25 minutes) with Fly540.

Road transport from the town is by Bus or minivans (matatu) which are found opposite the old market in the centre of Malindi. The main bus companies are Tahmeed, Tawakal and Simba Coaches, and they all run services to Lamu, Mombasa and Nairobi (via Mombasa).

6.0 Site Description

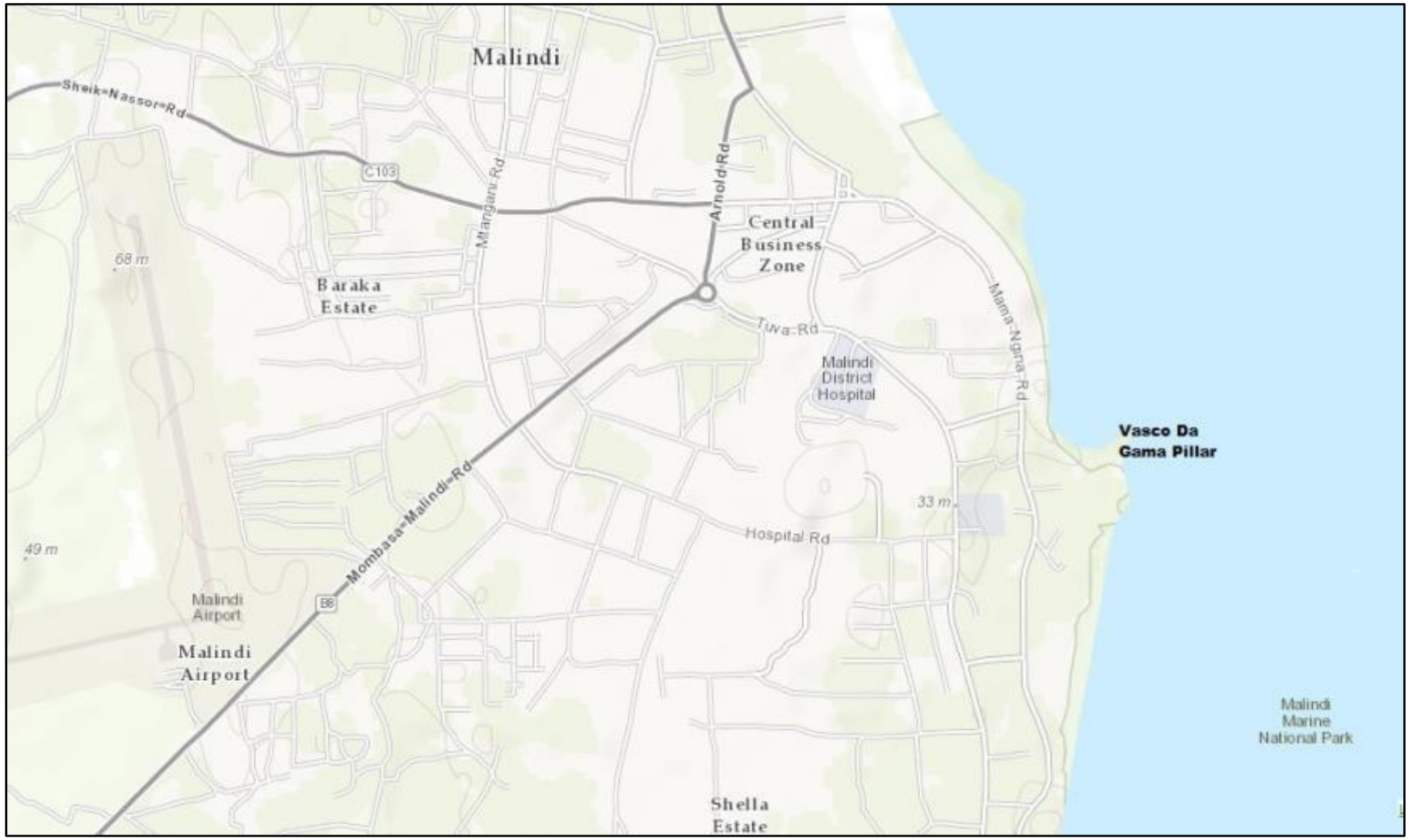


Figure 19: Vasco Da Gama Pillar is located off Silversand road on the sea front along the Shela beach in Malindi.

Vasco Da Gama pillar is in Malindi, Kilifi County. It is located in the busiest stretch of Malindi economic corridors. The pillar stands in line with the most attractive beaches and the most prestigious hotels. Next to the Vasco da Gama pillar is the Shela beach landing site that hosts most of the fishing vessels from artisanal, industrial trawlers and sport fishing boats. It is a popular tourism destination especially among Italian visitors. Malindi is served with a domestic airport and a highway between Mombasa and Lamu. The Vasco Da Gama pillar is at the southern tip of Malindi bay as is part of the town's tourism circuit.

6.1 Site Description

The Pillar is erected on a limestone bedrock. It is surrounded by residential buildings and a few villas. A fish marketing company has also set up a facility next to the official entrance of the Vasco Da Gama pillar. It can be accessed through Scorpion villas off Silversand road or by walking past the fisheries office and on to the beach during low tide. The site is mainly accessed by visitors who come to see and learn the history of the pillar, fishermen who dock in the adjacent area, residents of the neighboring homes, tour guides, staff of NMK among others. The existing entrance currently used as a ticketing office by NMK is also narrow and needs to be widened to accommodate passage of construction equipment and materials.

Figure 20: Aerial view of the areas adjacent to Vasco Da Gama pillar and surrounding activities

Figure 21: A view of previous efforts to support the reef terrace using reinforced concrete pillars and reduce the velocity of waves using concrete boulders.

6.2 Previous Erosion Prevention Efforts

There were previous attempts to break wave action that saw the placement of concrete blocks of about 1 m^3. Figure 23 below also shows another attempt at breaking the wave energy that causes erosion of the Vasco Da Gama base rock. The most affected areas are however the pillars that were erected to support the Vasco Da Gama Base rock. They have been extensively eroded with some section of steel bars rusting beyond recognition.

Figure 22: Eroded Sections of the support pillars of Vasco Da Gama promontory

Figure 23: Collection of Concrete Blocks Placed at the northern edge of Vasco Da Gama pillar as Wave Energy Breakers

Figure 24: A collection of rock boulders placed to Prevent Erosion of the Vasco Da Gama pillar

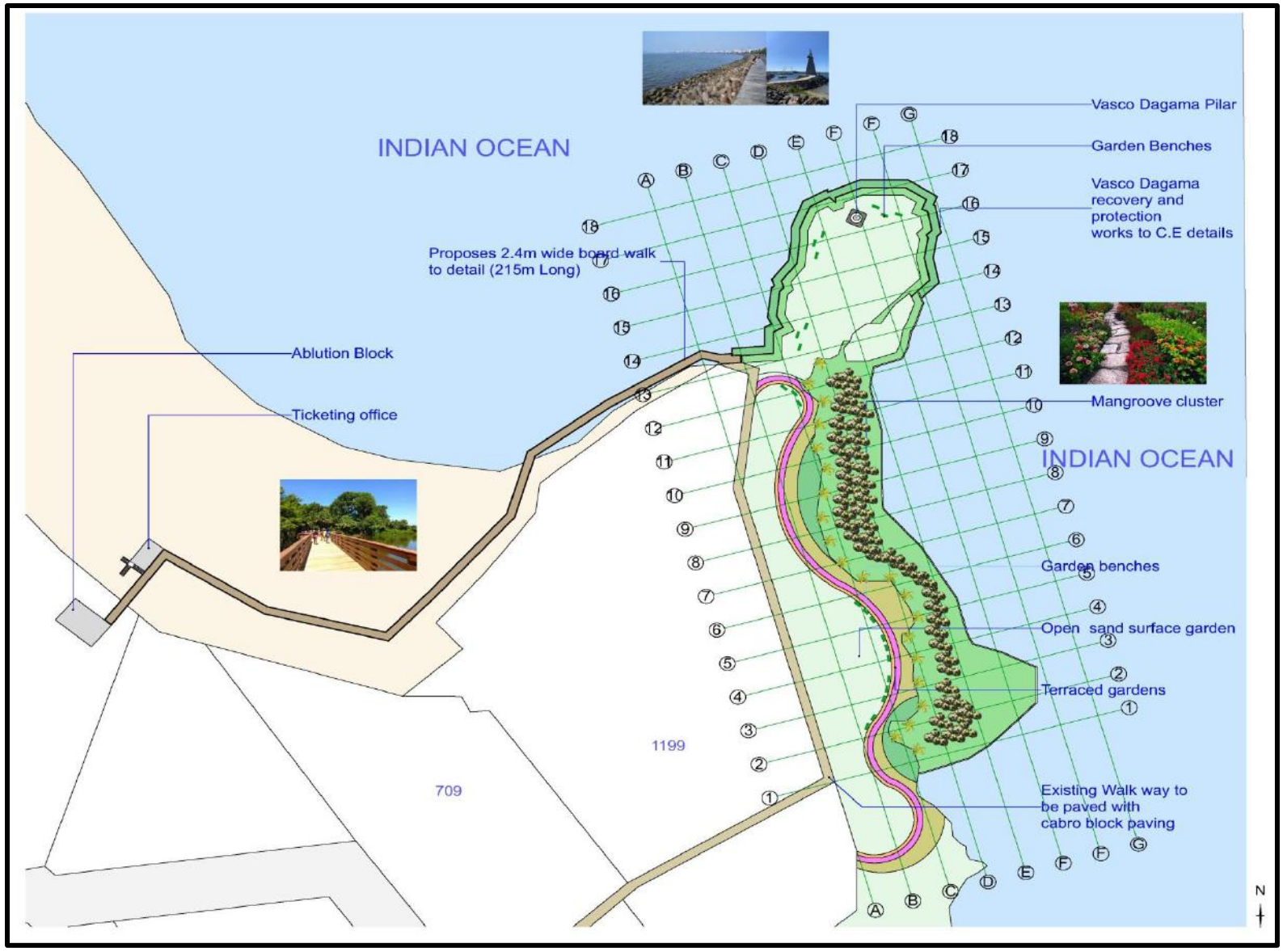
6.3 Project Scope

The scope of seawall construction works is as described here below: -

- ❖ Excavation and concrete strip footing under seawater and waterlogged soils
- ❖ Construction of seawall using concrete blocks
- ❖ Filling up with approved materials behind the seawall to make up levels
- ❖ Construction of concrete walkway
- ❖ Repairing the existing concrete works

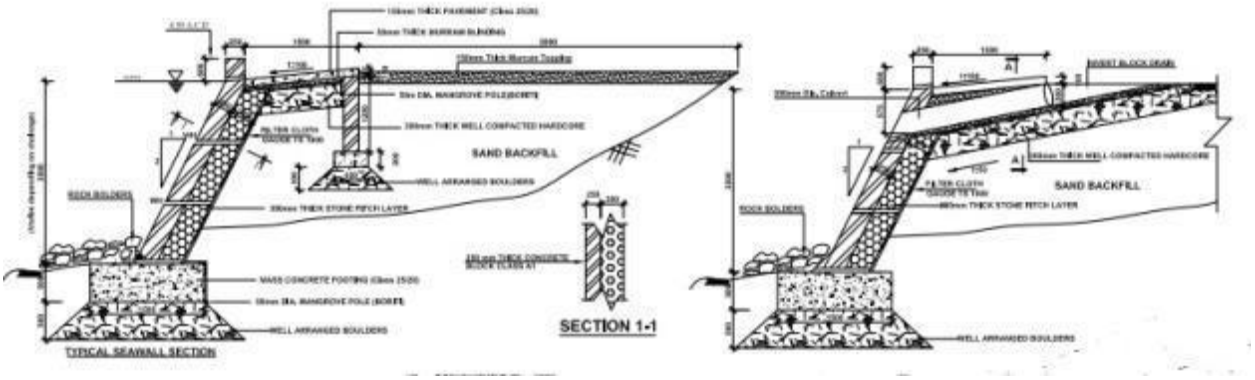
The following are some of the proposed interventions;

- Seawall
- New concrete blocks
- Ablution block
- Walkway
- New ticketing office
- Garden benches

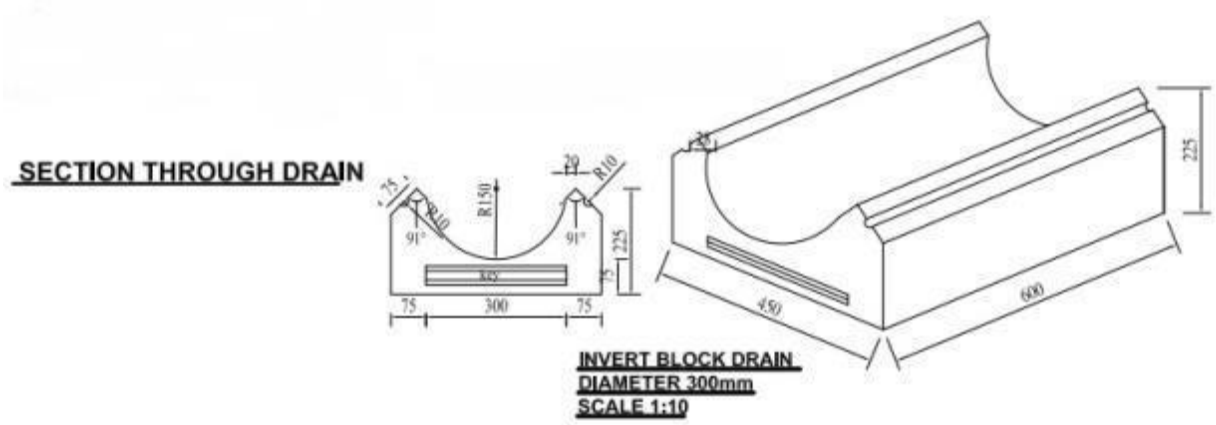

INDIAN OCEAN
Vasco Dagama Pilar
Garden Benches
Vasco Dagama recovery and protection works to C.E details
Proposes 2.4m wide board walk to detail (215m Long)
Ablution Block
Ticketing office
Mangroove cluster
INDIAN OCEAN
Garden benches
Open sand surface garden
Terraced gardens
1199
709
Existing Walk way to be paved with cabro block paving
N

6.4 Project Design

The proposed seawall will be constructed with a base of boulders at the bottom. The boulders will be in excess of 4 meters deep and they will be held together. This section will be 2.5 meters wide. Concrete mixture will be added to a 0.5-meter depth and 2-meter-wide above the base of boulders. All these will go below the seabed to act as the foundation. The proposed concrete will be of class 25/20.



A 300mm thick stone patch layer will be used to firm up the area which will be filled with sand. Beneath this wall will be a filter cloth of 1000 gauge. A double blinding of murram will be added on the wall patch each of 250mm. The top of the wall will be aligned with well compacted hardcore followed by a 50mm thick murram blinding. The final layer will be a thick pavement of 150mm class 25/20 concrete. The proposed seawall will also accommodate a 300mm diameter culvert for invert drainage of water during tidal change.



A detailed structural drawing is annexed in this report.

6.5 Project Layout

The seawall will be used to reinforce the bedrock and avoid collapse due to wave action. New rock boulders will be placed in the southerly tip of the rock outcrop to break the wave energy during the South East Monsoon season. The existing ticketing office will be refurbished an ablution block added. The walkway to the site will be paved and a few garden benches installed for visitors to sit.

7.0 Stakeholder Consultation

Stakeholder engagement is most effective when initiated at an early stage of the project development process, and is an integral part of early project decisions and the assessment, management and monitoring of the project.

Stakeholder engagements is critical in any construction project due to varied interests among different stakeholders. Effective stakeholder engagement can significantly improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.

Stakeholder engagement is an inclusive process conducted throughout the project life cycle. Where properly designed and implemented, it supports the development of strong, constructive and responsive relationships that are important for successful management of a project's environmental, heritage and social risks.

Stakeholder engagement is a process through which stakeholder 's influence and share concerns over development initiatives, the decisions and resources which affect them. It is a vital process that provides an avenue to involve project- affected groups and other stakeholders in the disclosure of information concerning a project, to deliberate at an early stage on issues that will need to be addressed both environmentally and socially and the course of action most suited to achieve mitigation of the negative impacts emanating from the development and implementation of the proposed project as well as enhancing project benefits to the stakeholders.

The objectives of engaging stakeholders in this project include the following;

(i) To identify the best methods for project developers to provide stakeholders with balanced and objective information on the proposed project and to obtain their feedback.

(ii) To develop a model for the contractor to use for enhanced community participation and collaboration through the project lifecycle, including environmental mitigation and management.

(iii) Develop strategies for the organization to use to build strong and effective relationships with stakeholders including the communities, regulatory officials, local government officials and national government officials.

(iv) Develop minimum standards/best practices for the proposed project in social and environmental engagement.

(v) To provide tools for effective resolution of community issues during project implementation.

7.1 Stakeholder Analysis

The table below was used in stakeholder analysis process. It was used to target respondents in the stakeholder participation process.

Table 23: Stakeholder Analysis Table for Vasco Da Gama Seawall Project

STAKEHOLDERS	STAKE/MANDATE	TARGET	KEY (×)	INTEREST	INFLUENCE
NATIONAL MUSEUMS OF KENYA	Protect and manage heritage sites	3	*	High	High
KENYA WILDLIFE SERVICE	Conserve and manage wildlife (both terrestrial and marine) in Kenya	2	*	High	High
WILDLIFE CLUBS OF KENYA – MALINDI OFFICE	Empower the young people of Kenya through conservation knowledge	1		Medium	High
FISHERIES DEPARTMENT – MALINDI	Fisheries management	2	*	High	High
BEACH MANAGEMENT UNIT – SHELLA	Management of fish-landing station, fishery resources and the aquatic environment	1	*	High	Low
MALINDI HOTEL OWNERS ASSOCIATION	Hotel owners' interests	10		Medium	High
TOUR GUIDES	Use the monument to employ themselves	5		Medium	Low
MALINDI MUSEUMS SOCIETY	Heritage preservation	2	*	High	High
BAOBAB VENTURES (KARUME)	Leading environmental activist in Malindi	1		Medium	Medium
BOAT OPERATORS	Marine tourism	10	*	Medium	Low
MALINDI SEA FISHING CLUB	Sport fishing	1		Medium	Low
MALINDI TOWN MANAGER	County Government Malindi Administrative Officer	1		Low	Low
WARD ADMINISTRATOR - SHELLA	County government administrative officer	1		Low	Low
TOURISM REGULATORY AUTHORITY	Tourism regulation	1		Medium	Medium
MALINDI MARINE ASSOCIATION	Marine conservation	1	*	High	High
WOMEN IN TOURISM	Women interest in Malindi tourism sector	1		Low	Low
FISHERMEN	Fisheries as a livelihood	20	*	High	Low
TOTAL		**60**			

7.2 Participation Process

The process is normally achieved through holding meetings and barazas to discuss the pros and cons of a project, however during this period of the Corona Virus (COVID-19) pandemic such action may exacerbate the spread of the virus and put more persons at risk. It was for this reason that NEMA released guidelines on conducting public participation for EIA, EA and SEA. The guidelines propose the use of ICT Innovations and use of comprehensive questionnaires among other measures to reduce risks associated with the spread of COVID-9 virus.

The consulting team avoid meetings since they would contravene the ban on all public events and the requirement for social distancing as ordered by the government. Experts opted for the following stakeholder engagement methods;

7.2.1 Key Informant Interviews

The key informants' interviews involved **interviewing** people who have particularly informed perspectives such as government employees whose docket interact with the proposed area or are directly affected by the proposed seawall in their respective dockets. These included key persons in National Museums of Kenya, Kenya Wildlife Service, Kenya marine and Fisheries Research Institute, Malindi Museums Association and Beach Management Unit.

7.2.2 Questionnaire Administration

A questionnaire was developed to cover the main issue surrounding the proposed seawall i.e. socio-economic and heritage value, bio-physical and fisheries aspects. Respondents were allowed breadth to discuss their views and raise any issues not covered in the questionnaire.

7.2.3 Focused Group Discussions

Focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest. It is a form of qualitative research where questions are asked about their perception's attitudes, beliefs, opinion or ideas. This method was mostly employed with fisherfolk and tour guides. All focus group discussions adhered to recommended social distancing rules set out in the COVID 19 guidelines.

Figure 25: Consultations with NMK Malindi Officials

Figure 26: Kilifi Fisheries Office Boatyard

7.3 Stakeholder Feedback

Some of the key feedback areas from stakeholders were as follows:

- Government agencies representatives were supportive of the process to secure the Vasco Da Gama pillar and protect from eminent collapse
- The seawall should not interfere with the aesthetic quality of the site
- There should be improved access to the site
- It is an important step towards preserving a key heritage feature in Malindi tourism attractions
- It is important to improve visitor experience by rehabilitating the site
- Local communities be given first priority during implementation
- The wall should not interfere with existing scenic beauty of the site

Most of the stakeholder's were excited about the proposed protection seawall since it would address most of the fears relating to the collapse of the pillar. Concerns raised are all discussed in the impacts stage and relevant mitigations measures proposed.

8.0 Project Alternatives

8.1 Analysis of alternatives

The analysis of alternatives process involves considering viable alternatives related to the project being assessed. This process provides for varied considerations being assessed against the proposed option and a decision made based of the most practical alternative.

8.2. Preferred Sea Wall Design

Below are cross sections of the proposed seawall.

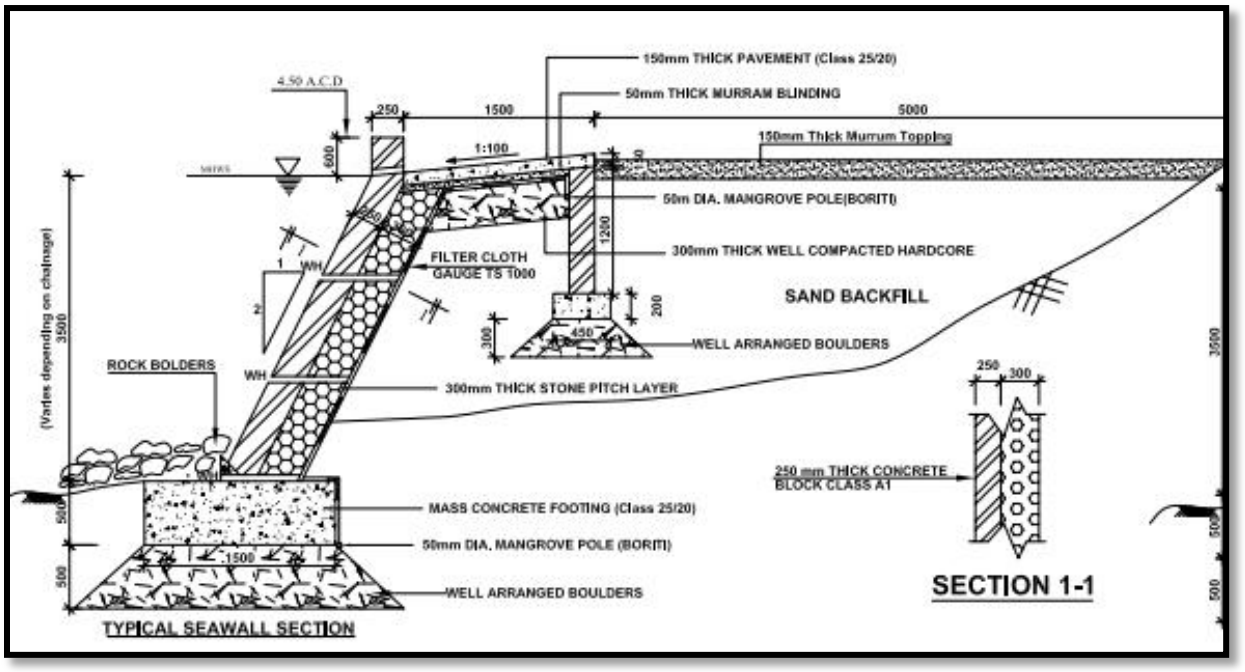


Figure 27: Cross section of the proposed wall

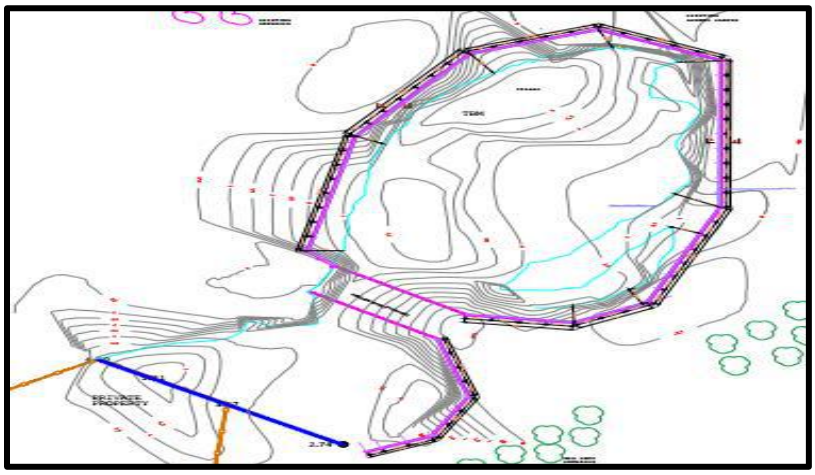


Figure 28: Layout of the Proposed Seawall Around Vasco Da Gama Site

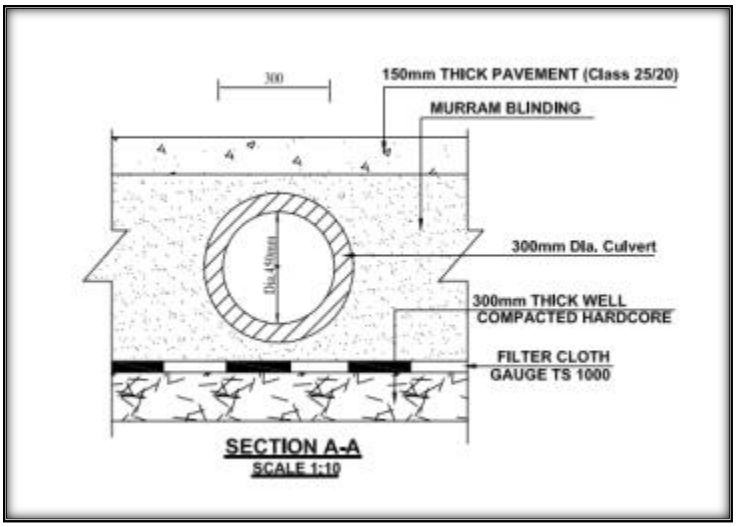


Figure 29: Cross section of drainage structure

8.3 Design Alternatives - Consideration of alternative designs can be for different purposes e.g. aesthetic purposes. This would allow for the design engineer to allow for different finish to the seawall to improve its aesthetic quality. This can result in allowing for artistic finish to the seawall design. However, the beach protection that a seawall provides far outweighs the aesthetic losses associated with its presence. The primary of objective is to protect the Vasco Da Gama pillar by bracing it against the crashing waves and rushing floodwaters of storms and diverting that energy away from bedrock hosting the pillar. The current design considers all viable options and will protect the pillar as intended.

8.4 Alternative Materials and Technology – This may include the proposed change of materials proposed to minimize impact or change technology applied to improve efficiency and performance. The most effective seawall designs are expensive. The cost of some structures may be a little less but this is for rudimentary works that are not expected to last over time or to sustain strong currents characteristic of the South East Monsoon season. Most of the low-cost structures cannot handle intense sea currents characteristic of the site. Despite the initial low-cost solutions, higher maintenance costs and reduced functional life are the consequence of these low-cost seawalls. Such piecemeal approach to solving shore erosion problems can be a major cause of continued failure and consequent financial losses. Some stakeholders had proposed the use of old vehicles filled with boulders and lowered to the bottom of the sea to break the wave energy affecting the pillar. This would be easily displaced by the high energy wave action characteristic of the area.

8.5 Site Layout Alternatives - This permits consideration of different spatial configurations of the seawall on site. This may include siting the concrete blocks towards the southern tip to be more effective in sheltering against the South East Monsoon winds. The design engineers have considered all possible options and have picked the most viable and effective siting to brace the base rock against wave action.

8.6 No Project Alternative - It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. The alternative would entail the continued functioning of the Vasco

Da Gama in its current form with no protection sea wall implemented. However, this option should not be considered as it is unlikely to survive given its current compromised state. The no project option is likely to have significantly negative impacts associated with the anticipated ultimate collapse of Vasco Da Gama pillar a key national monument in Malindi town.

9.0 Identification and Assessment of Potential Environmental Impacts

9.1 Introduction

This section identifies and discusses both negative and positive impacts associated with the proposed construction of the protection seawall at Vasco Da Gama pillar in Malindi. The impacts identification was split into two. The first assessment was done against the environmental, heritage and socio-economic components identified in the baseline. A second assessment was done to place the impacts across the three phases namely: Construction Phase, Operational Phase and Decommissioning Phase.

The baseline components were split into 4 key areas namely;

- ✓ Flora
- ✓ Fauna
- ✓ Heritage
- ✓ Socio-economic

Impact Component	Specific receptors	Impact Discussion	Positive	Negative	Negligible	Short term (Low)	Long term (High)
Flora	Coral reef	Data collected indicate that on 4% of the benthic is live coral within a 10 meter range from the proposed seawall construction which makes insignificantly low. It is also reported that coral reefs at this area are highly impacted by siltation/sedimentation and poor water quality from nearby Malindi town, and hence the area is not designated as of high priority for conservation. It is also crucial understand that the proposed protection seawall is more landward focusing on bracing the base rock of Vasco Da Gama pillar and holding it together to avoid erosion which gradually eat it up causing breakages and eventual collapse. In event of building material falling into the water, high like hood of dispersal by wave action will render the overall effect insignificant. The new seawall will also provide a suitable surface for coral reef growth.	☐	☒	☒	☐	☐
	Seagrass	The dominant seagrass species is Thalassodendron ciliatum, which provides shelter and food for a variety of herbivorous fish (e.g., rabbitfish, surgeon and parrotfish) and invertebrates. The other species also found particularly in shallower sections (i.e., rocky pools, sandy areas, soft substrate on the beach), including Halodule, Cymodocea, and Syringodium. They offer an important habitat for many herbivorous species. The direct impact will mainly occur during excavation. Indirectly the seagrass as a habitat will be affected by workers or dropping anchors etc. The extent of excavation for the strip foundation will be minimal. The impact is therefore classified as low and	☐	☒	☐	☒	☐

		short term.					
	Intertidal environment	In front of the project site, the intertidal area is highly dominated by seagrass covering nearly 60% of the benthos found in calm sheltered waters < 3m deep. At the base of the pillar is < 0.5m deep where the seawall will start. It is characterized by largely abiotic components such as rubble, sand/silt, and dead reef/coral. Biotic structure included macrolgae /Sargassum and live coral at less than 10%. The effect will be very low and short term. After the construction of the seawall it is expected that the recolonization will occur.	☐	☒			
	Mangroves	The Vasco Da Gama pillar area has no mangrove stands observed during the period of the assessment.	☐	☒	☒	☐	☐
Fauna	Sea turtles	Sea turtles rarely come to shore expect during the nesting event. The Vasco Da Gama pillar is not suitable for turtle nesting since it is rocky. Most of the nesting incidents are recording in sandy beaches close to the KWS office and in Watamu area. The impact on turtle will be negligible.	☐	☒	☒	☐	☐
	Marine mammal	Most of the marine mammals recorded in the area found in much deeper waters. The seawall is more on land and it is not likely for the mammals to go very shallow waters. The impact on marine mammals will be negligible.	☐	☒	☒	☐	☐
Heritage	Terrestrial archeology	The area along which the wall will be built was found to contain heritage that will be impacted negatively during construction and after. The pottery in the eastern and western intertidal area should be recovered before the project commences. An archaeological excavation should then be undertaken at Mr. Tanzini's house or the corner to the entrance to the Pillar, the likely route for	☐	☒	☐	☒	☐

		machinery ferrying construction material. This will ensure recovery and documentation of all archaeology therein. The same should be done at the boat landing site west of the Pillar. To mitigate against loss of pottery in the concentrations, all foreshore pottery should be recovered to the Museum. The impact is low and short term					
	Cultural Archeology	The entire area above the foreshore is heavily built with private homes, offices, villas, hotels and restaurants. A foot walking survey of this area of the Pillar was carried to out to explore for existence of ancient features and sites. West of the Pillar around the County fisheries office near the Portuguese Chapel was found the Baobab boat landing site where some pottery scatter was also recorded. Near the Pillar, to the south, is the home of Mr. Aramando Tanzini, the immediate neighbor, who confirmed that he always finds pottery inside his compound during construction. No sites, features or sites of community social significance were found in the foreshore survey.	☐	☒	☒	☐	☐
	Underwater cultural Heritage	During implementation, there will be debris movement from the construction site. These will be transported by sea action and are likely to completely bury the wood and pottery concentrations identified in the underwater. Again, the same debris can cause abrasion to the fragile wood and pottery hence destroying archaeological data. In addition, anchors from construction machines will be dragged by currents and cause breakage to the artifacts buried under the seabed. The seawall will affect the wood and pottery in concretion located in the underwater. Pottery is	☐	☒	☐	☒	☐

		inorganic and cannot be destroyed when taken out of the water. Again, it is inexpensive to treat, conserve and restore. As such the large bowl piece and pottery in concretion should be retrieved for conservation treatment at the Museum. Wood is organic and tends to get decay quickly once exposed to the outside. Further, it is very expensive to treat and restore. To mitigate against the impacts, these should be covered in a debris net and sandbags. This is an inexpensive procedure since the materials occur in a small area of 30m². These impacts are short term.					
Socio-economic	Tourism	The impacts will be positive and long term. Vasco Da Gama pillar is a key attraction in the Malindi tourism circuit. A number of visitors to the site have always suggested that the site be protected against eventual collapse. This is well documented in the visitors' book on site. The impact is long term in that it will save the monument from collapse and eventual loss. The site will provide a lot of short-term employment opportunities during construction and more long-term opportunities will occur during operation. Tour guides and safari companies have always cherished the presence of the site and sold its historical narrative to visitors who are always eager to learn about the ancient interactions between local people and visit explorers. This is the most significant positive impact of the protection seawall. It is positive and long term.	☒	☐	☐	☐	☒
	Health and sanitation	The proposed building of a sanitation block for visitors will also assist in improving the experience of visitors when they come to site. Other amenities such as walk ways and sitting areas will significantly add value to the	☒	☐	☐	☐	☒

		visitor experience. The impact would be positive and long term.					
	Water resources	During construction and operation, the site will require water. At the construction stage water will be used in different construction process including preparing concrete, cleanliness and drinking for workers. The operational phase will see water used for drinking and sanitation. Water being a resource that is sought after by many residents of Maindi, this means availability will decrease. However, at this stage we realize that the quantities will be very low compared to what is required by the entire Malindi population. This is a negative effect is low and long term.	☐	☒	☐	☒	☐
	Fisheries sector	The fisheries sector is not likely to be affected much during the construction stage. They are likely to benefit a lot with increased visitor traffic during operation of the monument. Opportunities include expanded customer base for their catch. The impact is positive and long term.	☒	☐	☐	☐	☒
	Road and other infrastructure	The roads leading to the site will be expanded and repaired for a better visitor experience. The presence of the monument will attract a lot of positive contributions by stakeholders in further improving the condition of the infrastructure serving visitors. This will be positive and low.	☒	☐	☐	☒	☒

9.2 Impact Identification and Assessment

The proposed seawall is aimed at protecting the Vasco Da Gama pillar monument which is facing potential collapse due to erosion by tidal waters and water passages which have eaten into promontory weakening its stability.

Several environmental impacts (positive and negative) associated with the proposed project were identified through public participation process and through the use of experts' judgment. The following section highlights the impacts anticipated throughout the lifecycle of the proposed project. The associated impact assessment tables for each impact will be categorized according to project phases, prior to and post mitigation. Effects of activities are categorized as negative impact and or positive impact.

First, the likely significance of the potential issues of concern have been determined and ranked according to the following:

- Potential environmental impacts that are deemed unlikely to be significant, and will need to be listed, and addressed in some way, but which will not require detailed assessment in the ESIA.

Secondly, the following characteristics have been defined for each impact:

Nature:

- Positive: applies to impacts that have a beneficial economic, environmental or social result, such as additional economic activity or enhancement of the existing environmental conditions.
- Negative: applies to impacts that have a harmful or economical aspect associated with them such as economical cost, loss or degradation of environmental resources.

Effect:

- Direct: applies to impacts which can be clearly and directly attributed to a particular impacting activity.
- Indirect: applies to impacts which may be associated with or subsequent to a particular impacting activity, but which cannot be directly attributed to it.

Time Range:

- Short Term: applies to impacts whose effects on the environment will disappear within a 1-year period, or within the construction phase.
- Medium Term: applies to impacts whose effects on the environment will disappear within a 5-year period following the construction phase.
- Long Term: applies to impacts whose effects on the environment will disappear in a period greater than 5 years following the construction phase.

Reversibility:

- Reversible: applies to impacts whose significance will be reduced and disappear over time (either naturally or artificially), once the impacting activity ceases.

- Irreversible: applies to impacts whose significance will not be reduced nor disappear over time (either naturally or artificially), once the impacting activity ceases.

Impact	Nature		Effect		Time Range			Reversibility	
	Positive	Negative	Direct	Indirect	Short term	Medium term	Long term	Reversible	Irreversible
Construction Phase									
Employment Opportunities	☒	☐	☒	☐	☒	☐	☐	☐	☒
Gains in the Local and National Economy	☒	☐	☒	☐	☒	☒	☐	☐	☒
Ready market demand for local construction-based supply companies	☒	☐	☒	☐	☒	☐	☐	☐	☒
Informal Sectors Benefits	☒	☐	☒	☐	☒	☐	☐	☐	☒
Noise pollution	☐	☒	☒	☐	☒	☐	☐	☒	☐
Generation of Exhaust Emission	☐	☒	☐	☐	☒	☐	☐	☒	☐
Dust Emissions	☐	☒	☐	☐	☒	☐	☐	☒	☐

Solid Waste Generation	☐	☒	☒	☐	☒	☐	☐	☒	☐
Disposal of Excavated Soil	☐	☒	☒	☐	☒	☐	☐	☒	☐
Increased water demand	☐	☒	☐	☒	☒	☐	☐	☐	☒
Workers accidents and hazards during construction	☐	☒	☒	☐	☐	☒	☐	☒	☒
Energy Consumption	☐	☒	☒	☐	☒	☐	☐	☐	☒
Extraction and Use of Building Materials	☐	☒	☐	☒	☒	☐	☐	☐	☒
Soil Erosion	☐	☒	☒	☐	☒	☐	☐	☒	☐
Oil Spills Hazards	☐	☒	☒	☐	☒	☒	☐	☒	☐
Destruction of existing vegetation	☐	☒	☒	☐	☒	☐	☐	☒	☐

Fire Outbreaks	☐	☒	☒	☐	☒	☐	☐	☒	☐
Heritage Resources	☐	☒	☒	☒	☐	☒	☒	☐	☒
Disruption of marine traffic of fishing vessels	☐	☒	☐	☒	☒	☐	☐	☒	☐
Disruption of road traffic	☒	☒	☐	☒	☒	☐	☐	☒	☐
Construction generated turbidity	☐	☒	☒	☐	☒	☐	☐	☒	☐

Impact	Nature		Effect		Time Range			Reversibility	
	Positive	Negative	Direct	Indirect	Short term	Medium term	Long term	Reversible	Irreversible
Operation Phase									
Job creation during operation	☒	☐	☒	☐	☐	☒	☐	☐	☒
Preservation of the Vasco Da Gama monument	☒	☐	☒	☐	☐	☒	☐	☒	☐

Improved visitor experience at the Vasco Da Gama	☒	☐	☒	☐	☐	☐	☒	☐	☒
New seawall habitat	☒	☐	☐	☒	☐	☒	☐	☐	☒
Solid waste generation	☐	☒	☒	☐	☒	☒	☐	☒	☐
Water pollution	☐	☒	☒	☐	☒	☐	☐	☒	☐

Impact	Nature		Effect		Time Range			Reversibility	
	Positive	Negative	Direct	Indirect	Short term	Medium term	Long term	Reversible	Irreversible
Decommissioning Phase									
Ecological restoration	☒	☐	☒	☐	☐	☐	☒	☒	☐
Employment opportunities	☒	☐	☒	☐	☒	☐	☐	☐	☒
Noise and Vibration	☐	☒	☒	☐	☒	☐	☐	☒	☐

Solid waste management	☐	☒	☒	☐	☒	☐	☐	☒	☐
Air pollution	☐	☒	☒	☐	☒	☐	☐	☒	☐

Table 24: Impact Analysis Table

9.3 Positive Impacts during Construction Phase

9.3.1 Employment Opportunities

The construction of the seawall will avail employment opportunities especially for casual workers from the local community. Creation of employment opportunities has both economic and social benefit. The economic benefit will engage a good number of unskilled labors. This translates to economic empowerment. Socially these young and energetic otherwise poor people will be engaged in productive employment other than remaining idle a getting involved in vices. Employees with diverse skills are expected to work on the site during the construction period.

9.3.2 Gains in the Local and National Economy

There will be gains in the local and national economy as a result of the construction of the proposed seawall, through consumption of locally available materials including: timber, metals, and cement among other construction materials. The consumption of these materials in addition to fuel oil and others will attract taxes including Value Added Tax (VAT) which will be payable to the government. The cost of the materials will be payable directly to the producers. The economy will also improve through the visitors coming to the Vasco Da Gama pillar and paying to learn and experience the monument.

9.3.3 Ready market demand for local construction-based supply companies

The project will require supply of large quantities of building materials most of which will be sourced locally from the surrounding areas. This provides ready market for building material suppliers such as quarrying companies, hardware shops and individuals with such materials. The contractor will use concrete mixtures and can source their ballast from Kilifi Jaribuni area and get their sand from Malindi. Mombasa Cement plant in Takaungu area will also have all required cement.

9.3.4 Informal Sectors Benefits

During construction phase of proposed seawall; the informal sectors are temporarily likely to benefit from the operations. This will involve kiosk operators who will be selling food to the construction workers on site. Boda boda operators will be ferrying workers and delivering small supplies to the site.

9.4 Negative Impacts during Construction Phase

The following negative impacts are also associated with the construction of the proposed seawall at Vaso Da Gama pillar in Malindi.

9.4.1 Noise pollution

The construction works of the proposed seawall will to be noisy operation due to the moving machines (mixers, tippers, communicating workers) and incoming vehicles to deliver construction materials to site. The construction workers who will be working in the site will generate some noise as they are communicating to one another. This will be a potential source of disturbance to the surrounding residential neighborhood. The impact however will not be major.

9.4.2 Generation of Exhaust Emissions

Exhaust emissions are likely to be generated by the construction equipment during the construction phase of proposed seawall. Motor vehicles that will be used to ferry construction materials would cause

air quality impact by emitting pollutants through exhaust emissions. The impacts will be direct, permanent but not significant.

9.4.3 Dust Emissions

Particulate matter pollution is likely to occur during the site clearance, excavation and spreading of the topsoil during construction of proposed seawall. There is a very small possibility of PM10 suspended and settleable particles affecting the site workers and even neighbors' health, it is minimal given the construction method of minimum excavation and nil cart away of soil. The impacts will be direct, temporary and minor.

9.4.4 Disposal of Excavated Soil

Excavated materials need to be handled in accordance with the NEMA Waste Management Regulations and cannot be dumped indiscriminately. The contractor has to pick a site for disposal and have NEMA approve it beforehand. It is recommended that the material can be reused on site which will be a better way of handling waste.

9.4.5 Increased water demand

During the construction phase of the proposed seawall, both the construction workers and works will be using water that will cause additional demand for water in addition to the existing demands. Water will be mostly used in the creation of concrete for construction works and for wetting surfaces or cleaning completed structures. It will also be used by the construction workers to wash themselves and even drink. The impact will be direct, permanent and minor.

9.4.6 Workers accidents and hazards during construction

During construction works, it is expected that construction workers especially non-skilled casuals are exposed to injuries and hazards. The seawall involves intensive engineering and construction activities including concrete work, steel erection and welding among others, construction workers will be exposed to risks of accidents and injuries. Such injuries can result from accidental falls from high elevations, injuries from hand tools and construction equipment cuts from sharp objects. The impacts will be direct and minor.

9.4.7 Energy Consumption

During the construction phase of the seawall will consume fossil fuels (mainly diesel) to run transport vehicles and construction machinery. Fossil energy is non-renewable and its excessive use may have serious environmental implications on its availability, price and sustainability. The impact will be direct, permanent and major.

9.4.8 Extraction and Use of Building Materials

Building materials such as hard core, ballast, cement, rough stone and sand required for the construction will be obtained from quarries, hardware shops and sand harvesters who extract such materials from natural resource banks such as rivers such as Sabaki dunes and quarries in Jaribuni area. The availability and sustainability of such resources at the extraction sites will be negatively affected as they are not renewable in the short term. In addition, the sites from which the materials will be extracted may be significantly affected in several ways including landscape changes, displacement of

animals and vegetation, poor aesthetic quality and opening of depressions on the surface leading to several human and animal health impacts. The impact will be direct, temporary and minor.

9.4.9 Solid Waste Generation

During construction a lot of solid waste will be generated. These wastes include papers used for packing cement, plastics, metal scraps and timber remain among others. Dumping of these wastes around the proposed project site will interfere with the aesthetic quality of the area. This has a direct effect to the surrounding community. Disposal of these solid wastes off-site could also be a social inconvenience if done in the wrong places. The off-site effects could be aesthetic, pest breeding, pollution of physical environment, invasion of scavengers and informal recycling communities. The impact is direct, temporary and minor.

9.4.10 Soil Erosion

There are possibilities of soil erosion occurring during the construction of the seawall especially during rainy and windy seasons. The impact will however be minimal as the area to be disturbed in the proposed development is relatively small. The impacts will be direct, temporary and minor.

9.4.11 Oil Spills Hazards

The construction machines on the proposed site for the seawall have moving parts which will require continuous oiling to minimize the usual corrosion or wear and tear. This will contaminate the soil on land and the sea. Likewise, moving vehicles on site may require oil change. The impact will be direct, temporary and major.

9.4.12 Destruction of existing vegetation

The construction process of the seawall and other associated facilities and structures will involve clearing of the existing vegetation cover on site. There will also be vegetation clearance creating and expanding roads to allow access to the site. The impact will be direct, permanent and minor.

9.4.13 Fire Outbreaks

Due to various construction activities at the seawall project, fire outbreaks can occur. Handling of inflammable products increases fire risks like the fuels and oils used to run the machines. The impact will be direct, temporary and major.

9.4.14 Loss of Heritage Resources

Impacts during construction will emanate from trenching and earth moving during construction of piers, backfilling, approach roads, and associated facilities. The archaeological materials including their contexts will therefore be crushed, disturbed and destroyed and in essence their archaeological research value lost completely.

Underwater cultural heritage directly within the construction from the smallest of archaeological artifacts such as ceramics, glass, wood, etc. or, large pieces of shipwreck timbers etc. will be crushed by machines and destroyed. Shipwrecks that have been underwater for hundreds of years are fragile and any slightest disturbance will break them down. any shipwreck within the area will be damaged and lost under the backfill forever.

During construction of the wall, barges and boats movement over the will continuously cause water turbulence. This will lead to disturbance of the fine clay matrix sea bottom. This will lead to exposure of fragile buried sites hence their destruction. In addition, boat anchors can be dragged by the sea current and cause breakage of the wooden shipwrecks.

The construction process can lead to loss of valuable heritage resources that are buried in the vicinity of the seawall. The impact will be direct, permanent and major therefore an archeologist must be involved.

9.4.15 Disruption of marine traffic of fishing vessels

The construction process might disrupt smooth movement of fishing vessels as it is next to the Shela Beach Management Unit where many boats anchor. It is will also occur on a path often used by fishermen when approaching the shore to land their catch. The impact is direct, temporary and minor.

9.4.16 Disruption of road traffic

The nature of the access roads around the proposed seawall site at Vasco Da Gama pillar will definitely cause inconveniences for other road users and residents during the construction process. Delivery of materials and machinery might cause traffic jams in the area and inconveniences while using the existing route to access the site. The impact is direct, temporary and minor.

9.4.17 Construction generated turbidity

Coral reefs are generally a community of diverse assemblages of flora and fauna that are dependent on hard/rock substrate on which to grow and clean water that lets high light availability in the water column. Coral reefs are very fragile and sensitive to pollution, turbidity and sediment inputs from terrestrial and/or dredging activities in marine environment.

They are therefore vulnerable to the following threats:

i) Physical breakage during drilling of rock bottom and ship anchoring in the vicinity
ii) Smothering of corals and other sessile organisms by sediments during seawall constructions
iii) Toxic impacts from release of pollutants in oil spills
iv) Noise and vibration have an impact on fish and motile life behavior
v) Sediment in the water column reduces light availability and hence can impact negatively coral survival and feeding of plankton feeders.

The impact is direct, temporary and minor.

9.4 Positive Impacts during Operation Phase

9.4.1 Job creation during operation

The operation of the Vasco Da Gama pillar will rejuvenate tourism since it is a key attraction in Malindi. It provides jobs for NMK staff who man the site, tour operators to who arrange for safaris, tour guides who take the visitors to the site etc. The impact of the monument on tourism is direct, permanent and major.

9.4.2 Promotion of Vasco Da Gama as a Tourist attraction

The Vasco Da Gama pillar has been taught in all schools in the country as part of the coastal history of Kenya. It is a national monument and thus a significant part of our history. Any efforts towards saving it from destruction will definitely promote its presence and preserve its significance in our history as a country and the region. The impact is direct, permanent and major.

9.4.3 Protection of the National Monument - Vasco Da Gama pillar

The construction of the seawall will serve to protect the Vasco Da Gama pillar in Malindi. It will break the power of the wave currently causing damaging erosion of the base rock the hosts the monument. The impact is direct, permanent and major.

9.4.4 Improved visitor experience at the Vasco Da Gama

The presence of the seawall will provide a calm experience for visitors during high tide. It will be reassuring to the visitors some of whom have expressed fears of collapse of the pillar. The new rehabilitated site will have necessary amenities for visitors such as seats, wash rooms, walk ways and educative displays. The impact is direct, permanent and minor.

9.4.5 New seawall habitat

The seawall will provide a new habitat for growth of benthic organisms. This will increase biodiversity found in the intertidal zone. The impact is indirect, permanent and minor.

9.4.6 Enhanced visitor safety

The safety of visitors from harsh weather because of the slope that will break the strong waves pounding the pillar will be greatly reduced by the presence of the seawall. Additional safety features will be provided to reduce the risk to visitors who come to the site. The impact is indirect, permanent and major.

9.5 Negative Impacts during Operation Phase

9.5.1 Solid waste generation

The proposed seawall will make the Vasco Da Gama site fully operational thereby receiving more visitors. The visitors will generate some amounts of solid waste during the tours to the site. The bulk of the solid waste generated during the operation of the project will consist of paper, plastic bottles and food etc. Such wastes can be injurious to the environment. The impact will be direct, permanent and major.

9.5.2 Water pollution

The Vasco Da Gama site will provide sanitation facilities for visitors to the site. These facilities functions produce waste water that will require treatment before disposal. This is a potential source of water pollution. Discarding waste directly into the sea will also cause water pollution. There is need therefore for the project proponent to put in place an efficient waste management scheme that will prevent the accumulation of uncontrolled waste, as well as an efficient collection system and off-site disposal. The impact is indirect, temporary and minor.

9.6 Positive Impacts during Decommissioning Phase

10.6.1 Ecological restoration

Upon decommissioning of the proposed seawall, rehabilitation of the project site will be carried out to restore the site to its original status or to a better state than it was originally. The impact is direct, temporary and minor.

9.6.2 Employment opportunities

For faster and timely demolition to take place, several people will be involved. As a result, several employment opportunities will be created for the demolition staff during the demolition phase. The impact will be direct, temporary and minor.

9.7 Negative Impacts during Decommissioning Phase

9.7.1 Noise and Vibration

The demolition works will lead to significant deterioration of the acoustic environment within the project site and the surrounding areas. This will be because of the noise and vibration that will be experienced because of demolishing the proposed seawall. The impact will be direct, temporary and minor.

9.7.2 Solid waste management

Demolition of the proposed seawall and other related infrastructure will generate solid waste. The waste will contain the materials used in construction including concrete, metal, drywall, wood, glass, paints, adhesives, sealants and fasteners. Although demolition waste is generally considered as less harmful to the environment since they are composed of inert materials, there is growing evidence that large quantities of such waste may lead to release of certain hazardous chemicals into the environment. The impact will be direct, permanent and major.

9.7.3 Air pollution

Dust will be generated during demolition works of the proposed seawall. This will affect demolition staff as well as the neighbors. The impact will be direct, temporary and minor.

10.0 Proposed Mitigation Measures

This section highlights the mitigation measures for the expected negative impacts of the proposed seawall. The potential impacts and the possible mitigation measures have herein been analyzed under three phases: Construction, Operational and Decommissioning.

10.1 Mitigation for Negative Impacts during Construction Phase

The following measures can be considered as mitigation measures of the negative impacts associated with the proposed
seawall during construction phase.

10.1.1 Reduce Noise Pollution

The project proponent of the proposed seawall should put in place several measures that will mitigate noise pollution
arising during the construction phase. The following noise-suppression techniques will be employed to minimize the impact
of temporary construction noise at the project site.

- ✓ The contractor will employ the best available work practices on-site to minimize occupational noise levels.
- ✓ Delivery of raw materials will be limited to off peak hours which is between 10.00am and 4.00pm daily.
- ✓ Construction hours will be limited to the hours of 8.00 a.m. and 5.00 pm daily.
- ✓ Machinery, vehicles and instruments that emit high levels of noise will be used on a phased basis to reduce the overall impact. These equipment's such as drills, excavators and cement mixers will be used when the least number of residents are expected to be affected, for example during periods where most residents are at work or school.
- ✓ Awareness will be created to the machine drivers to switch off engines when not in use.
- ✓ All construction equipment will be regularly inspected and maintained in good working condition.
- ✓ Co-ordinate with relevant agencies regarding all construction
- ✓ Use of appropriate PPE by workers.

10.1.2 Reduce Exhaust Emissions

In order to control exhaust emissions that are likely to occur during the construction of the proposed seawall, the following measures shall be implemented during construction.

- ✓ Vehicle idling time shall be minimized
- ✓ Alternatively fuelled construction equipment shall be used where feasible

- ✓ Equipment shall be properly tuned and maintained
- ✓ This will also be achieved through proper planning of transportation of materials to be used during construction of the project to ensure that vehicle fills are increased in order to reduce the number of trips done or the number of vehicles on the road.

10.1.3 Reduce Dust Emissions

Controlling dust emissions that is likely to take place during construction phase of the proposed seawall is useful in minimizing nuisance conditions. It is recommended that a standard set of feasible dust control measures be implemented for all construction activities. Emissions of other contaminants (NOx, CO2, SOx, and diesel related PM_{10}) that would occur in the exhaust from heavy equipment are also included. The project proponent is committed to implementing measures that shall reduce air quality impacts associated with construction.

- ✓ During construction, any stockpiles of earth should be enclosed / covered / watered during dry or windy conditions to reduce dust emissions;
- ✓ Construction trucks removing soil from the site, delivering sand and cement to the site should be covered to prevent material dust into the surrounding areas;
- ✓ All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction. This means that construction workers will be trained regarding the minimization of emissions during construction.
- ✓ Specific training will be focused on minimizing dust and exhaust gas emissions from construction vehicles. Drivers of vehicles used during construction will be under strict instructions to minimize unnecessary trips and minimize idling of engines.
- ✓ During construction, where water is available, sprinkle the construction area with water to keep dust levels down.
- ✓ Masks should be provided to all personnel in areas prone to dust emissions throughout the period of construction.
- ✓ Drivers of construction vehicles must be supervised so that they do not leave vehicles idling, and they limit their speeds so that dust levels are lowered.
- ✓ Maintain all machinery and equipment in good working order to ensure minimum emissions including carbon monoxide, NOX, SOX and suspended particulate matter;

10.1.4 Avoid Disposal of Excavated Materials

The excavated material during the construction of the seawall will not be disposed. The excavated material will be removed, temporarily stored and then can be used for backfill. It is recommended that part of the topsoil excavated from the proposed construction site be re-use in areas to be landscaped to enhance plant health.

10.1.5 Reduce Water Demand

The proponent and contractor should ensure that water is used efficiently at the site by sensitizing construction staff to avoid irresponsible water use. Sea water can be used for activities that do not require fresh water and are not likely to cause pollution.

10.1.6 Reduce Workers Accidents and Hazards

To reduce the workers accidents and hazards during the construction phase of the proposed seawall, the contractor and proponent are expected to adhere to the provisions of the Occupational Safety and Health Act, 2007 and its subsidiary legislation. It is the responsibility of the project proponent and contractor to provide a safe and healthy environment for construction workers as outlined in the EMP. The proposed laboratory Response and Evacuation Plan must be in place in addition to safety education and training shall be provided to the employees. Appropriate PPEs must be provided for all workers.

10.1.7 Reduce Energy Consumption

The project proponent and contractor shall ensure responsible electricity use at the construction site through sensitization of staff to conserve electricity by switching off electrical equipment or appliances when they are not being used. In addition, proper planning of transportation of materials will ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. Complementary to these measures, the proponent shall monitor energy use during construction and set targets for reduction of energy use.

10.1.8 Reduce Extraction and Use of Building Materials

The proponent will source building materials such as sand, ballast and hard core from registered quarry and sand mining firms whose projects have undergone satisfactory Environmental Impact Assessment/Audit and received NEMA approval. Since such firms are expected to apply acceptable environmental performance standards, the negative impacts of their activities at the extraction sites are considerably well mitigated.

To reduce the negative impacts on availability and sustainability of the materials, the proponent will only order for what will be required through accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities. Moreover, the proponent will ensure that wastage, damage or loss (through run-off, wind, etc.) of materials at the construction site is kept minimal, as these would lead to additional demand for and extraction or purchase materials.

In addition to the above measures, the proponent shall consider reuse of building materials and use of recycled building materials. This will lead to reduction in the amount of raw materials extracted from natural resources as well as reducing impacts at the extraction sites.

10.1.9 Minimize Solid Waste Generation

It is recommended that demolition and construction waste be recycled or reused to ensure that materials that would otherwise be disposed of as waste are diverted for productive uses. In this regard, the proponent is committed to ensuring that construction materials left over at the end of construction will be used in other projects rather than being disposed off. In addition, damaged or wasted construction materials be recovered for refurbishing and use in other projects. Such measures will involve the sale or donation of such recyclable/reusable materials to construction companies, local community groups, institutions and individual residents or home owners.

The contractor shall put in place measures to ensure that construction materials requirements are carefully budgeted for and to ensure that the amount of construction materials left on site after construction is kept minimal. It is further recommended that the proponent should consider the use of

recycled or refurbished construction materials. Purchasing and using once-used or recovered construction materials will lead to financial savings and reduction of the amount of construction debris disposed off as waste. Additional recommendations for minimization of solid waste generation during construction of the proposed seawall include: -

- ✓ Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time
- ✓ Provision of facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements
- ✓ Purchase of perishable construction materials such as paints incrementally to ensure reduced spoilage of unused materials
- ✓ Use of building materials that have minimal packaging to avoid the generation of excessive packaging waste
- ✓ Use of construction materials containing recycled content when possible and in accordance with accepted standards.
- ✓ Adequate collection and storage of waste on site and safe transportation to the disposal sites and disposal methods at designated area shall be provided.

10.1.10 Minimize Soil Erosion

The contractor will put in place some measures aimed at minimizing soil erosion and associated sediment release from the project site during construction. These measures will include terracing and levelling the project site to reduce run-off velocity and increase infiltration of rain water into the soil. In addition, construction vehicles will be restricted to designated areas to avoid soil compaction within the project site, while any compacted areas will be ripped to reduce run-off. Surface runoff and roof water from temporary site offices shall be harvested and stored reservoirs for reuse.

Re-vegetate exposed areas around the site so as to mitigate erosion of soil by storm water runoff. The final site grade should facilitate drainage and avoid flooding and pooling. A site drainage plan should be developed to protect against erosion. Protecting stockpiles through the use of silt fencing and reduced slope angles should be used to minimize soil erosion during construction. Installation of drainage ditches, construction of runoff and retention ponds is necessary. Minimization of disturbances and scarification of the surface should be observed to reduce erosion impacts. All slopes and working surfaces should be returned to a stable condition and topsoil on the final site would be graded and planted as appropriate.

10.1.11 Prevent Oil Spills Hazards

The contractor will put the following measures in place;

- ✓ Prepare an oil spill emergency response plan
- ✓ Implement preventive measures to avoid oil spills
- ✓ Report any spill to the relevant authorities to activate response mechanisms

10.1.12 Fire Controls

The site must contain firefighting equipment of recommended standards and in key strategic points all over the proposed project site of the proposed seawall. Portable fire extinguishers, Dry chemical systems, Carbon dioxide systems, Detection/alarm systems, among others. A fire evacuation plan must be posted in various points of the including procedures to take when a fire is reported. All workers must be trained on fire management and fire drills undertaken regularly.

10.1.13 Salvage of Archeological and Heritage Resources

Mitigation for terrestrial heritage that would otherwise be destroyed by the seawall construction will involve complete retrieval through rescue archaeological excavation. This will be done through complete documentation and excavation for all archaeological artifacts on land. The excavation will be undertaken at Portuguese Chapel, in the compound of Mr. Aramando Tanzini, who is the immediate neighbor of the Pillar and the Kilifi County Fisheries area.

Mitigation for socio-cultural heritage will entail documentation and relocation of the community shrines within the project area. This may include conducting sacrifices and Islamic ceremonies and performing religious rites and cleansing ceremonies in collaboration with the community.

Maritime and Underwater cultural heritage:

- ✓ Mitigation will entail documentation and retrieval of the underwater artifacts within construction areas earmarked for excavation, backfilling.
- ✓ Rescued materials will be given on-site conservation treatment before removal to Malindi Museum.
- ✓ Mitigation for any identified shipwreck site will involve documentation, survey and covering with appropriate materials such as debris nets and sandbags.
- ✓ To mitigate against loss of cultural heritage on the maritime heritage on the intertidal area, there will be complete documentation of sites likely to be impacted by the project.
- ✓ As mentioned earlier, world over, it is traditional boat landing sites that have eventually developed into major ports. These sites have histories from their occupation sequences / chronologies as they have existed for many years. In this case, the landing site of Baobab that is within the Vasco da Gama seawall Project will be archaeologically studied and documented.

10.1.14 Manage Road Traffic Congestion

- ✓ Provide for safe environment for all road users.
- ✓ Provide protection for workers, visitors, and the general public from traffic hazards that may rise as a result of the construction activity.
- ✓ Minimize the disruption, congestion and delays to all road users.
- ✓ Ensure that appropriate and sufficient warning and information signs and guidance are provided on site.
- ✓ Ensure that all needs of road users; motorists, pedestrians, cyclists, public transport passengers are accommodated at and through the work site.

10.1.15 Reduce Construction Generated Turbidity

- ✓ Adopt an engineering procedure during construction that minimizes sediment resuspension in the water column and transport by wind and currents to these habitats
- ✓ Use appropriate anchoring techniques to minimize boat damaging sea bed bottom
- ✓ Prepare reef restoration contingency plan in case of heavy impacts from the project action.
- ✓ Implement an environmental monitoring programme on habitat and biodiversity to minimize any adverse effect are detected and minimized as early as possible.

10.2 Mitigation for Negative Impacts during Operation Phase

10.2.1 Solid waste management

Increased visitor traffic at the Vasco Da Gama monument will subsequently result in solid waste management nuisance. The proponent will have to develop guidelines on visitor conduct and provide facilities to solid waste management collection and sorting. NEMA has provided extensive strategies and guidelines on waste handling for different categories.

10.2.2 Water Pollution Control

The site will have to ensure all waste water will be handled as required by the NEMA Waste Management guidelines. The site will have to adhere to all rules governing waste water treatment. This will be crucial in ensuring that waste water discharged into the environment will not too harmful to the receiving environment.

10.3 Mitigation for Negative Impacts during Decommissioning Phase

10.3.1 Noise and Vibration

A ssignificant impacts on the acoustic environment will be mitigated by the project proponent and shall put in place several measures that will mitigate noise pollution arising during the decommissioning phase. The following noise-suppression techniques will be employed to minimize the impact of temporary demolition noise at the project site.

- ✓ Install portable barriers to shield compressors and other small stationary equipment where necessary.
- ✓ Use quiet equipment (i.e. equipment designed with noise control elements).
- ✓ Co-ordinate with relevant agencies regarding all demolition activities.
- ✓ Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible.
- ✓ Demolish mainly during the day. The time that most of the neighbours are out working.

10.3.2 Solid waste management

Solid waste resulting from demolition or dismantling works associated with the seawall during decommissioning phase will be managed as follows:

- ✓ Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of demolition waste generated during decommissioning phase
- ✓ Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements
- ✓ Adequate collection and storage of waste on site and safe transportation to the disposal sites and disposal methods at designated area shall be provided.

10.3.3 Air pollution

High levels of dust concentration resulting from demolition or dismantling works will be minimized as follows:

- ✓ Watering all active demolition areas as and when necessary to lay off dust.
- ✓ Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard.
- ✓ Pave, apply water when necessary, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at demolition sites.

11.0 Environmental and Social Management Plan

11.1 Introduction

Environmental and Social Management Plan (ESMP) for development projects provides a logical framework within which identified negative environmental and socio–economic impacts can be mitigated and monitored. In addition, the ESMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures and monitoring can be done. ESMP is a vital output of an Environmental Impact Assessment as it provides a checklist for project monitoring and evaluation. The ESMP outlined below addresses the identified potential negative impacts and mitigation measures of the proposed laboratory during construction, operational and decommissioning phases, based on the Chapter of Environmental Impacts and Mitigation Measures of the expected Negative Impacts.

This section presents the environmental and social management plan (ESMP) for the proposed project. The ESMP specifies the mitigation and management measures which the proponent will undertake and shows how the project will mobilize organizational capacity and resources to implement these measures. The ESMP covers information on the management and/or mitigation measures that will be taken into consideration to address impacts in respect of the following project phases: construction, operation and decommissioning.

11.2 Significance of ESMP

Environmental and Social Management Plan (ESMP) for development projects provides a logical framework within which identified negative environmental impacts can be mitigated. In addition, the ESMP assigns responsibilities of actions to various actors and provides a timeframe within which mitigation measures can be done. ESMP is a vital output of an Environmental Impact Assessment as it provides a checklist for project monitoring and evaluation. The ESMP outlined below have addressed the identified potential negative impacts and mitigation measures of the proposed construction of seawall, operational and decommissioning phases.

11.3 Construction Phase ESMP

Table 25: Construction ESMP

Construction Phase	
Potential Impact	Mitigation Measure
Noise pollution	✓ The contractor will employ the best available work practices on-site to minimize occupational noise levels. ✓ Delivery of raw materials be limited to off peak hours which is between 10.00am and 4.00pm daily. ✓ Construction hours will be limited to the hours of 8.00 a.m. and 5.00 pm daily. ✓ Machinery, vehicles and instruments that emit high levels of noise will be used on a phased basis to reduce the overall impact. These equipment's such as drills, excavators and cement mixers will be used when the least number of residents are expected to be affected, for example during periods where most residents are at work or school. ✓ Create awareness for machine drivers to switch off engines when not in use. ✓ Regularly and maintain inspect all construction equipment in good working

	condition. ✓ Co-ordinate with relevant agencies regarding all construction activities. ✓ Provide appropriate PPEs for workers.
Exhaust and Dust Emissions	✓ Alternatively, fuelled construction equipment shall be used where feasible ✓ During construction, any stockpiles of earth should be enclosed / covered / watered during dry or windy conditions to reduce dust emissions; ✓ Construction trucks removing soil from the site, delivering sand and cement to the site should be covered to prevent material dust into the surrounding areas; ✓ All personnel working on the project will be trained prior to starting construction on methods for minimizing air quality impacts during construction. This means that construction workers will be trained regarding the minimization of emissions during construction. ✓ Specific training will be focused on minimizing dust and exhaust gas emissions from construction vehicles. Drivers of vehicles used during construction will be under strict instructions to minimize unnecessary trips and minimize idling of engines. ✓ During construction, where water is available, sprinkle the construction area with water to keep dust levels down. ✓ Provide masks to all personnel in areas prone to dust emissions throughout the period of construction. ✓ Supervise drivers of construction vehicles not to leave vehicles idling, and limit their speeds so that dust levels are lowered. ✓ Maintain all machinery and equipment in good working order to ensure minimum emissions including carbon monoxide, NOX, SOX and suspended particulate matter.
Disposal of Excavated Soil	✓ Reuse excavated material in back filling areas excavated. ✓ Excess excavated materials to be disposed in authorized dumping site. ✓ Spoil materials on site to be removed accordingly. ✓ Avoid placing excavated soils near water ways. ✓ It is recommended that part of the topsoil excavated from the proposed construction site be re-spread in areas to be landscaped to enhance plant health.
Increased water demand	✓ Ensure efficient water use on site by sensitizing construction staff to avoid wastage. ✓ Use sea water can be used for activities that do not require fresh water and are not likely to cause pollution.
Workers accidents and hazards during construction	✓ Report any accident on site within 12 hours. ✓ Conduct investigations of the accident and file the prepared report within 48hours. ✓ Provide workers on site with appropriate PPE. ✓ Erect appropriate signs on the site to warn workers and visitors. ✓ Ensure that the drivers and machine operators hired are qualified and experienced.

	✓ Provide first aid kit and a trained first aider be always be on site ✓ No worker should be allowed on site under the influence of alcohol or other inebriating substances. ✓ Display at prominent places occupation health and safety rules. ✓ Test and approve equipment such as ladder before use. ✓ Appropriate insurance should be acquired as per the law. ✓ Develop and display and emergency evacuation procedure. ✓ Moving parts of machines should be guarded to protect workers from injury.
Energy Consumption	✓ Sensitize project staff to ensure responsible electricity use at the construction site to conserve electricity by switching off electrical equipment or appliances when they are not being used. ✓ Plan transportation of materials to ensure that fossil fuels (diesel, petrol) are not consumed in excessive amounts. ✓ Minimize Artificial Lighting and Make Use of Skylight Windows. ✓ Install Motion Sensitive Light Switches. ✓ Establish Energy Efficient Practices. ✓ Properly Maintain Office Equipment.
Extraction and Use of Building Materials	✓ Source building materials such as sand, ballast and hard core from registered quarry and sand mining firms whose projects have undergone satisfactory Environmental Impact Assessment/Audit and received NEMA approval. These firms are expected to apply acceptable environmental performance standards, the negative impacts of their activities at the extraction sites are considerably well mitigated. ✓ Reduce negative impacts on availability and sustainability of the materials, contractor should only order for what will be required through accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities. ✓ Discourage wastage, damage or loss (through run-off, wind, etc.) of materials at the construction to reduce additional demand for and extraction or purchase materials. ✓ Encourage reuse of building materials and use of recycled building materials. This will lead to reduction in the amount of raw materials extracted from natural resources as well as reducing impacts at the extraction sites.
Solid Waste Generation	✓ Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time ✓ Provide facilities for proper handling and storage of construction materials to reduce the amount of waste caused by damage or exposure to the elements ✓ Purchase of perishable construction materials such as paints incrementally to ensure reduced spoilage of unused materials ✓ Use building materials that have minimal packaging to avoid the generation of excessive packaging waste ✓ Use construction materials containing recycled content when possible and in accordance with accepted standards. ✓ Adequate collection and storage of waste on site and safe transportation to

	the disposal sites and disposal methods at designated area shall be provided.
Soil Erosion	✓ Terrace and level the project site to reduce run-off velocity and increase infiltration of rain water into the soil. ✓ Restrict construction vehicles to designated areas to avoid soil compaction within the project site and rip any compacted areas to reduce run-off. Surface runoff and roof water from temporary site offices shall be harvested and stored reservoirs for reuse. ✓ Re-vegetate exposed areas around the site so as to mitigate erosion of soil by storm water runoff. The final site grade should facilitate drainage and avoid flooding and pooling. ✓ Prepare a site drainage plan to protect against erosion. ✓ Protect stockpiles through the use of silt fencing and reduced slope angles should be used to minimize soil erosion during construction. ✓ Install drainage ditches, construction of runoff and retention ponds where necessary. ✓ Minimizee disturbances and scarification of the surface to reduce erosion impacts. ✓ All slopes and working surfaces should be returned to a stable condition and topsoil on the final site would be graded and planted as appropriate.
Oil Spills Hazards	✓ Prepare an oil spill emergency response plan ✓ Implement preventive measures to avoid oil spills ✓ Report any spill to the relevant authorities to activate response mechanisms
Destruction of existing vegetation	✓ Identify important stands of vegetation, large contiguous stands of forest or other habitat, vegetation on steep slopes, and stream corridors or swales. ✓ Incorporate these areas into design layout or open space system. ✓ Protect such areas during construction by temporary fencing and limitations on access for heavy machinery and materials storage.
Fire Outbreaks	✓ Provide firefighting equipment of recommended standards and in key strategic points all over the proposed project site of the proposed seawall. ✓ Prepare a fire evacuation plan and must be posted in various points of the including procedures to take when a fire is reported. ✓ Train all workers on fire management and fire drills undertaken regularly.
Loss of Heritage Resources	✓ Undertake archaeological excavation to rescue. This will be done through complete documentation and excavation for all archaeological artifacts on land. The excavation will be undertaken at Portuguese Chapel, in the compound of Mr. Aramando Tanzini, who is the immediate neighbor of the Pillar and the Kilifi County Fisheries area. ✓ Ensure documentation and retrieval of the underwater artifacts within construction areas earmarked for excavation, backfilling. ✓ Rescued materials will be given on-site conservation treatment before removal to Malindi Museum. ✓ Survey and document any identified shipwreck site. These sites will be secured by covering with appropriate materials such as debris nets and

	sandbags. ✓ Document all cultural heritage in the intertidal area likely to be impacted by the project. ✓ Study and document traditional boat landing sites. These sites have histories from their occupation sequences / chronologies as they have existed for many years. In this case, the landing site of Baobab that is within the Vasco da Gama seawall Project will be archaeologically studied and documented.
Manage Road Traffic Congestion	✓ Provide for safe environment for all road users. ✓ Provide protection for workers, visitors, and the general public from traffic hazards that may rise as a result of the construction activity. ✓ Minimize the disruption, congestion and delays to all road users. ✓ Ensure that appropriate and sufficient warning and information signs and guidance are provided on site. ✓ Ensure that all needs of road users; motorists, pedestrians, cyclists, public transport passengers are accommodated at and through the work site.
Construction generated turbidity	✓ Adopt engineering procedures during construction that minimizes sediment resuspension in the water column and transport by wind and currents to these habitats ✓ Use appropriate anchoring techniques to minimize boat damaging sea bed bottom ✓ Prepare reef restoration contingency plan in case of heavy impacts from the project action. ✓ Implement an environmental monitoring programme on habitat and biodiversity to minimize any adverse effect are detected and minimized as early as possible.

11.4 Operational Phase ESMP

Table 26: Operation Phase ESMP

Operation Phase	
Potential Impact	Mitigation Measure
Solid waste management	✓ Manage solid waste at the newly refurbished Vasco Da Gama monument which will lively experience increased visitor traffic. ✓ Develop guidelines on visitor conduct and provide facilities to solid waste management collection and sorting. ✓ Adhere to all NEMA guidelines on waste handling for different waste categories. ✓ Conduct annual audit of the site to ensure solid waste is well managed.

Water Pollution Control	✓ Ensure all waste water will be handled as required by the NEMA Waste Management guidelines. The site will have to adhere to all rules governing waste water treatment. This will be crucial in ensuring that waste water discharged into the environment will not too harmful to the receiving environment.

11.5 Decommissioning Phase ESMP

Table 27: Decommissioning Phase ESMP

Decommissioning Phase	
Potential Impact	Mitigation Measure
Noise and Vibration	✓ Install portable barriers to shield compressors and other small stationary equipment where necessary. ✓ Use quiet equipment (i.e. equipment designed with noise control elements). ✓ Co-ordinate with relevant agencies regarding all demolition activities. ✓ Limit pickup trucks and other small equipment to a minimum idling time and observe a common-sense approach to vehicle use, and encourage workers to shut off vehicle engines whenever possible. ✓ Demolish mainly during the day. The time that most of the neighbours are out working.
Solid waste management	✓ Use of durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of demolition waste generated during decommissioning phase ✓ Provision of facilities for proper handling and storage of demolition materials to reduce the amount of waste caused by damage or exposure to the elements ✓ Adequate collection and storage of waste on site and safe transportation to the disposal sites and disposal methods at designated area shall be provided.
Air pollution	✓ Water all active demolition areas as and when necessary to lay off dust. ✓ Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard. ✓ Pave, apply water when necessary, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at demolition sites.

12.0 Environmental Monitoring Plan

Table 28: Monitoring Plan

Item	Activities	Responsibility	Frequency	Parameter
Ambient air quality	✓ Establish a baseline of air quality in the project site ✓ Undertake periodic sampling during project implementation and after ✓ Share audit reports with NMK and NEMA	NMK	Quarterly	O2, CO2, H2S, NO2, CO, SO2
Ambient Noise/vibration level	✓ Establish a baseline of noise levels in the project site ✓ Undertake periodic sampling during project implementation and after ✓ Share audit reports with NMK and NEMA	NMK	Monthly	Lmax, Lmin, Leq Levels
Occupational hazards	✓ Appoint a safety advisor on site to periodically supervise implementation of safety protocols ✓ Prepare monthly audit reports and share with NMK and local DOSHS office	NMK	Quarterly	Number of accidents or incidents

Marine ecosystem monitoring	✓ Prepare a comprehensive baseline survey of the marine ecosystem prior to commencement ✓ Undertake periodic assessments during project implementation ✓ Share monitoring reports with NMK/NEMA and KWS	NMK	Quarterly	Species presence/coverage
Oil Spills	✓ Prepare an oil spill contingency plan prior to commencement ✓ Undertake periodic sampling of water during project implementation ✓ Share monitoring reports with NMK. KMA and NEMA	NMK	Monthly	Oil spill incidences reported
Archeological	✓ Meet with contractors and engineer to check on chance finds and rescue heritage artifacts ✓ Collect curate, manage and store of artifacts found ✓ Share reports with NMK	NMK	Monthly	

13. Conclusions and Recommendations

This environmental impact assessment study has been carried out in line with the guidelines provided in the second and third schedules of the Legal Notice No 101, The Environmental (Impact Assessment and Audit) Regulations, 2003. A heritage impact assessment report was prepared and used to justify the protection seawall for Vasco Da Gama pillar. The study has also given strong emphasis on the socio-economic impacts of the proposed project on the neighboring communities and the measures to be undertaken by the proponent to mitigate the negative impacts. The study has analyzed alternatives available to the proponent with regard to securing the historical monument associated with early trade along the East African coastline.

The analysis of the ESIA has revealed the proposed protection seawall at Vasco Da Gama in Malindi will have positive impacts to the Proponent and the national monument is secured. The impacts will include preservation of the Vasco Da Gama pillar, employment to local community members, increase in the national/local investment, increase in Government revenue, boost in tourism experience. However, despite the outlined positive impacts, the proposed development will cause some negative impacts such as Noise Pollution, dust generation, Soil erosion, solid waste generation, Occupational hazards among others.

An Environmental and Socio- economic Management Plan (E&SMP) has been developed to ensure sustainability of the project area activities from construction through operation to decommissioning. The plan provides a general outlay of the activities, associated impacts, mitigation action plans and appropriate monitorable indicators. Implementation timeframes and responsibilities are defined, and where practicable, the cost estimates for recommended measures are also provided.

From the findings of this study, the following conclusions are made:

- The adverse impacts are temporary during the construction phase and can be managed to acceptable levels with the implementation of the recommendation of the mitigation measures proposed in the ESMP.
- The potential adverse impacts associated with the proposed project can be mitigated successfully. Most of the negative impacts are temporary, short term and reversible.
- The project will be designed, constructed, and operated according to international best practices. Successful implementation of the proposed ESMP will ensure environmental sustainability.
- The proposed project has high value socio-economic benefits which if neglected can cause irreversible loss of Vasco Da Gama pillar in Malindi a key national monument. In addition, its implementation would boost tourism sector in Malindi town.

The proposed project design has integrated mitigation measures with a view to ensuring compliance with all the applicable laws and procedures. The protection seawall and associated structures will be constructed to the required planning/architectural/structural designs and standards. During project implementation, operation and decommissioning stages **sustainable environmental management (SEM***)* would be ensured; avoiding inadequate use of natural resources, conserving nature sensitively and

guaranteeing a respectful and fair treatment of all people working on the project, general public at the vicinity and the expected beneficiaries of the project.

It is strongly recommended that a concerted effort is made by the site management in particular, to implement the Environmental and Social Management Plan prescribed. Following the commissioning of the project, continuous monitoring and statutory Environmental and Safety Audits must be carried out in compliance with the national legal requirements, and the environmental performance of the site operations should be evaluated against the recommended measures and targets laid out in this report.

Considering the proposed location, construction, management, mitigation and monitoring plan that will be put in place, the project is considered important, strategic and beneficial and may be allowed to proceed.

Recommendations for the prevention and mitigation of adverse impacts are as follows:

- All solid waste materials and debris resulting from construction of the seawall must be disposed off at approved sites.
- Construction activities must be undertaken only during the day i.e. between 0800 hours to 1700 hours. This will minimize disturbance to the general public within the proximity of the site/project.
- The proponent and contractor should follow the guidelines as set by relevant authorities to safeguard and envisage environmental management principles during construction, operation and decommissioning of the proposed seawall.
- Maintenance activities for vehicles must be carried out in service bays and garages off site to reduce chances of oils or grease or other maintenance materials, from coming into contact with environment (water or soil).
- Ensure proper water usage during construction phases.
- Proper and regular maintenance of construction machinery and equipment will reduce emission of hazardous fumes and noise resulting from friction of rubbing metal bodies.
- Workers must be provided with complete protective and safety gear. They must have working boots, complete overalls, helmets, gloves, earmuffs, nose-masks, goggles etc.
- Fully equipped first aid kits must be provided within the construction site.
- NMK to fulfil its mandate by ensuring No archaeological/heritage artifacts are lost, damaged or destroyed during the construction process by adhering to all the proposed mitigation measures outlined in this study, the various relevant guidelines and legislation governing heritage protection and ecosystem integrity protection, public and worker health and safety, management of wastes and hazardous materials.
- NEMA to ascertain compliance with the provided ESMP and set NEMA regulations and Standards.

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Annex

1. All Detailed Drawings of the Proposed Seawall

INDIAN OCEAN

Vasco Dagama Pilar

Garden Benches

Vasco Dagama recovery and protection works to C.E details

Proposes 2.4m wide board walk to detail (215m Long)

Ablution Block

Ticketing office

Mangroove cluster

INDIAN OCEAN

Garden benches

Open sand surface garden

Terraced gardens

Existing Walk way to be paved with cabro block paving

1199

709

N

NOTES

1.Drawing should not be scaled.

2.Contractor must verify conditions on site and report any discrepancies to the Landscape Architect.

3.All requisite utility locates must be contained by the contractor prior to digging.

4.Existing trees on site to be retained at Landscape Architect's discretion with client's approval.

5.Existing trees in hard landscaped zones to receive grates to Detail.

6.All trees and shrubs to be installed must be supported with stakes 600 mm higher than them.

7.All deleterious material excavated from the site to be removed and replaced with topsoil and well rotted manure mixed in 4:1 ratios.

8.All plants to be inspected by the Landscape Architect prior to commencement of planting.

9.Written quantities of plant materials supersede the graphical representation.

revisions

project

PROPOSED PROTECTION WORKS VASCO-DA GAMA PILLAR

drawing title

LANDSCAPE LAYOUT PLAN

client ministry/department

NATIONAL MUSEUMS OF KENYA
P.O.BOX 40658 - 00100
NAIROBI

client signature

scale		
	1	
	2	
	3	

project job no.	drawing no.
WP ITEM No. D113/CO/KLF/1901	

	name	signed	date
P.L.Arch.	A. Kimondo		
Checked	Arch J.M Murigu		
Team Leader	Arch. L.L.Kibisu		

APPROVED

Architect S.K Muli, OGW

CHIEF ARCHITECT

Signed.....Date.....

MINISTRY OF TRANSPORT, INFRASTRUCTURE,PUBLIC WORKS, HOUSING AND URBAN DEVELOPMENT

STATE DEPARTMENT OF PUBLIC WORKS
ARCHITECTURAL DEPARTMENT

FOR THE GOVERNMENT OF THE REPUBLIC OF KENYA

EXISTING BOULDERS

EXISTING ARMOUR BLOCKS

EXISTING BOULDERS

PILLAR

TBM

SEAWALL

CORAL REEF OUTLINE

HOLLOW CAVE (PASSAGE)

NEW ROCK BOULDERS

NEW ROCK BOULDERS

PRIVATE PROPERTY

4.10

5.21

3.67

2.74

3.79

NOTES

1. This drawing is to be read in conjunction with all other relevant Architectural / Structural drawings.
2. The Contractor to confirm all dimensions on site before commencing the works.
3. Figured dimensions only to be taken and all dimensions are in millimetres unless stated otherwise.
4. Structural concrete to be class 25/20
   Concrete cover to reinforcement including links should be
5. Reinforcement steel to be;
   T-square ribbed high yield bars to BS 4461.
   R-round mild bars to BS 4449.
6. Blinding Concrete to be 1:4:8 mix.
7. All Reinforcement steel must be approved by the Structural Engineer before casting.
8. All excavations to be inspected and approved by the Structural Engineer .

ISSUES

DATE	TO	APPLICATION	

REVISIONS

	DATE	BY	DESCRIPTIONS	GRP. LDR.	C.S. ENG.

REFERENCE DRAWINGS

No.	DESCRIPTIONS

CLIENT
NATIONAL MUSEUMS OF KENYA

JOB No.

PROJECT TITLE
PROPOSED VASCO DA GAMA SEAWALL CONSTRUCTION CONCRETE REHABILITATION WORKS

DRAWING TITLE
VASCO DA GAMA TOPOGRAPHICAL AND SEAWALL LAYOUT AND TOPOGRAPHICAL

FOR THE GOVERNMENT OF THE REPUBLIC OF KENYA

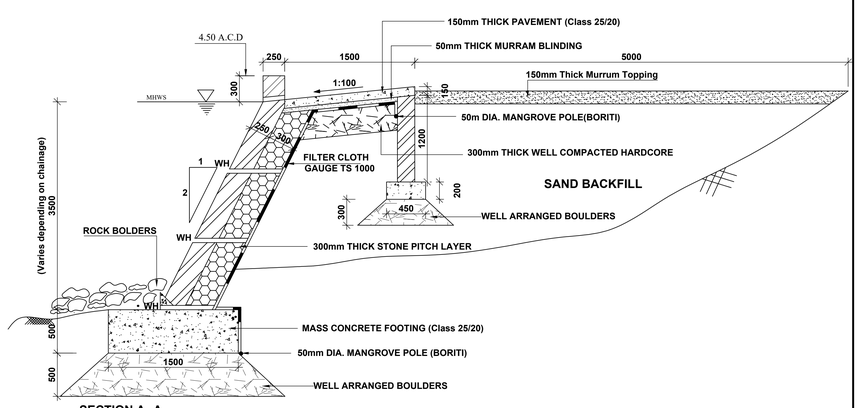
C1/Sfb		
MLH&UD	DRG No. / FILE No.	SD/ /STR02
SCALE(S) 1:100		FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING

APPROVED BY

ENG. H.J.N NYAANGA
THE CHIEF ENGINEER (STRUCTURAL), M.O.T. I. H.UD&PW

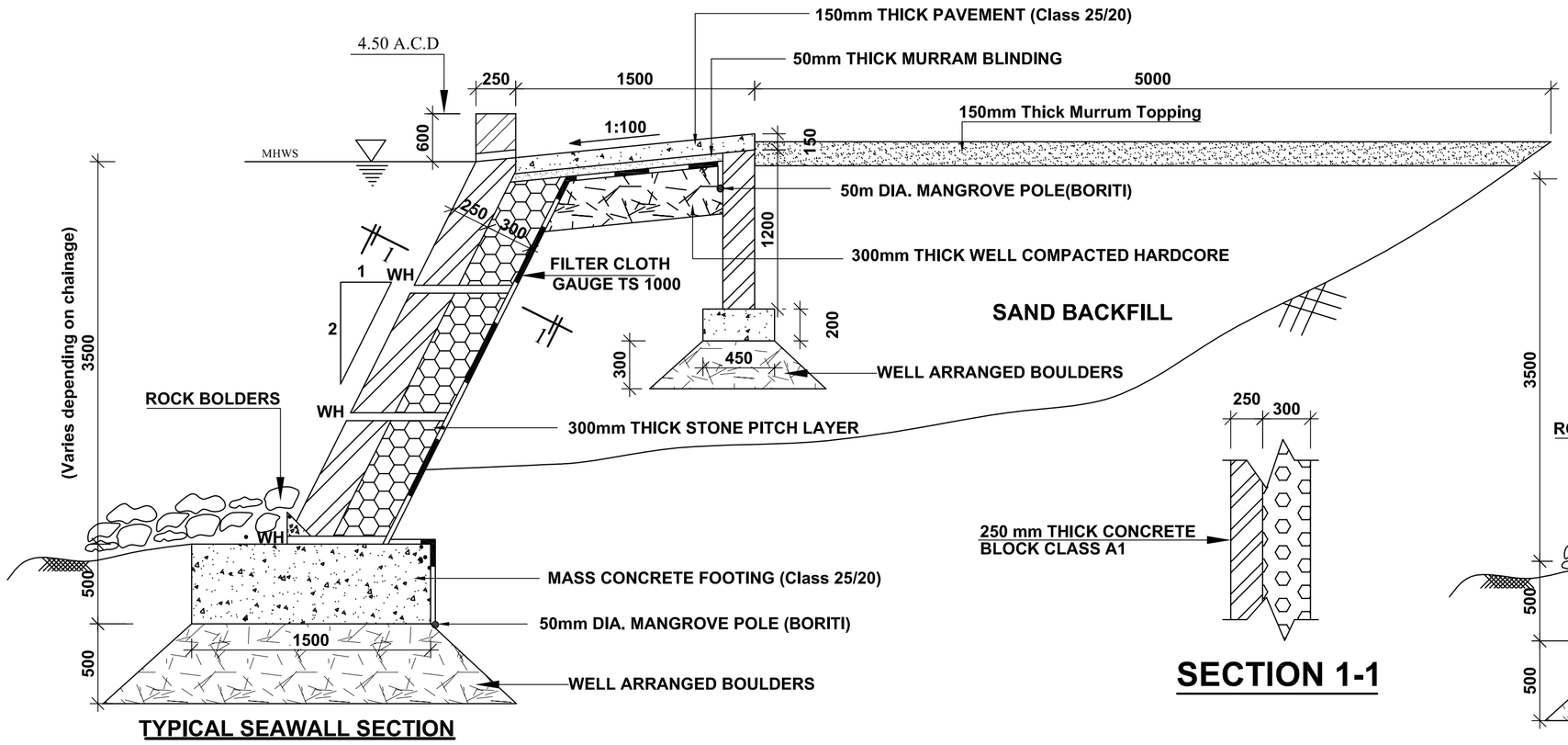
	NAME	SIGNATURE	DATE
DESIGN/DRAWN	ENG. L. M. KEGERA		
PRINC.SUPT ENGINEER			
SNR.PRINC.SUPT ENGINEER	ENG.G. N. MUTALA		

MINISTRY OF TRANSPORT INFRASTRUCTURE, HOUSING, URBAN DEVELOPMENT AND PUBLIC WORKS



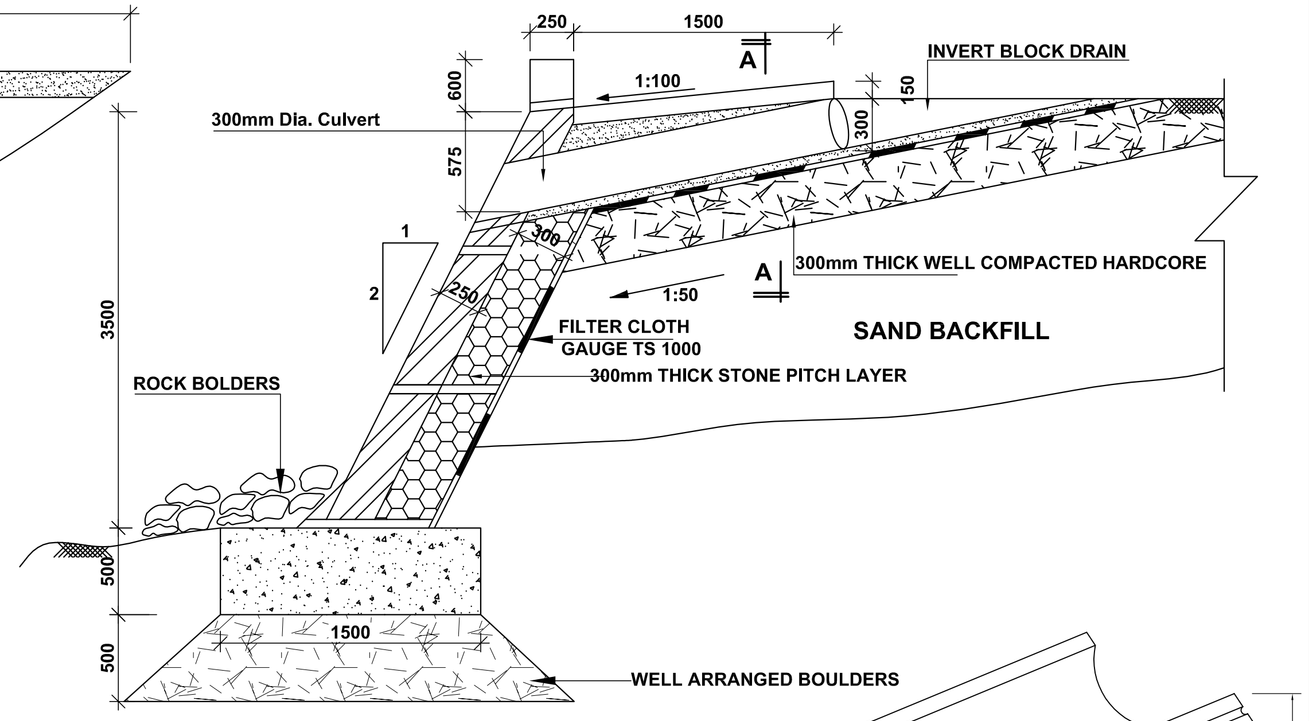
SECTION A--A

2. Heritage Impact Assessment

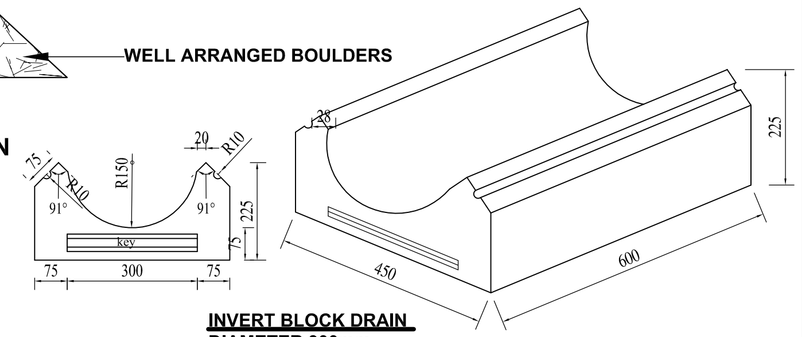


TYPICAL SEAWALL SECTION

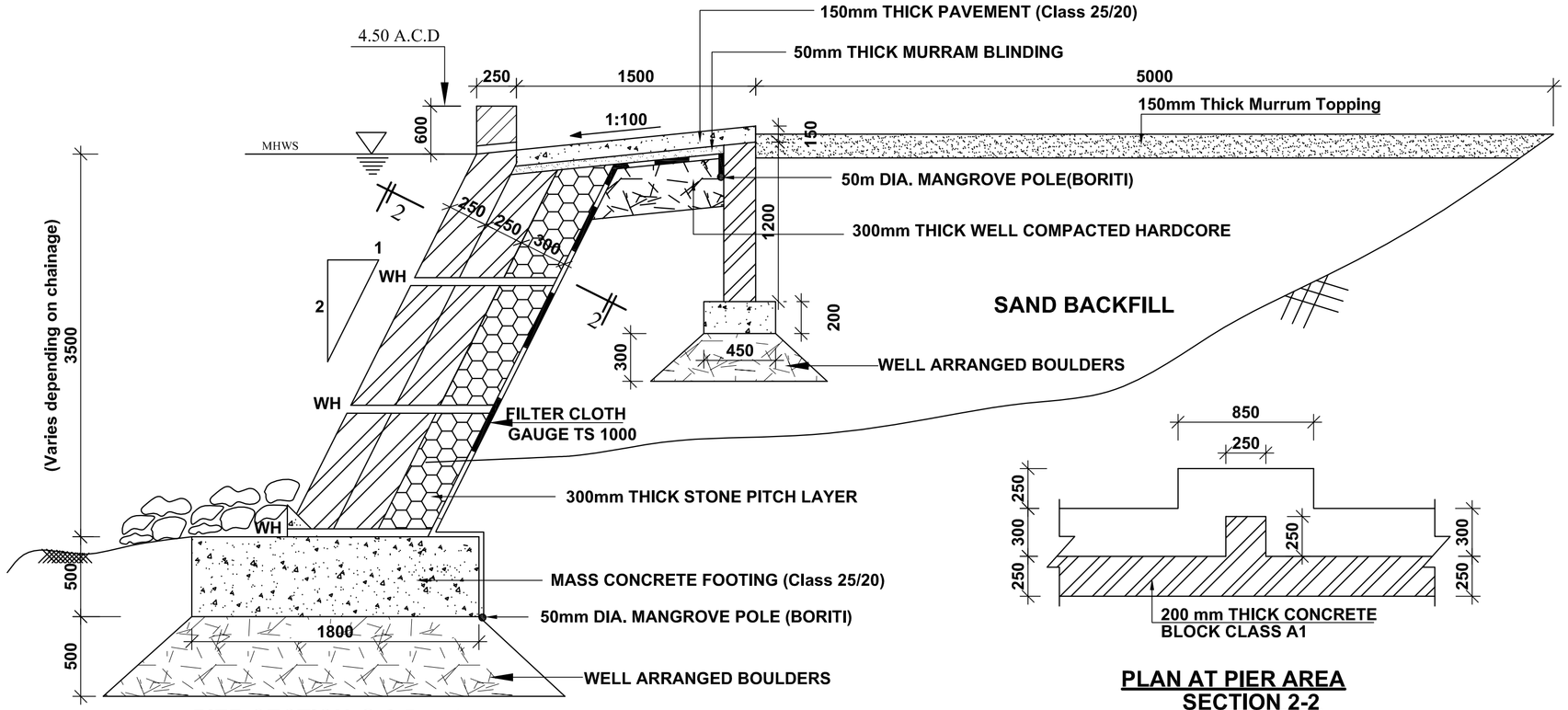
SECTION 1-1



SECTION THROUGH DRAIN

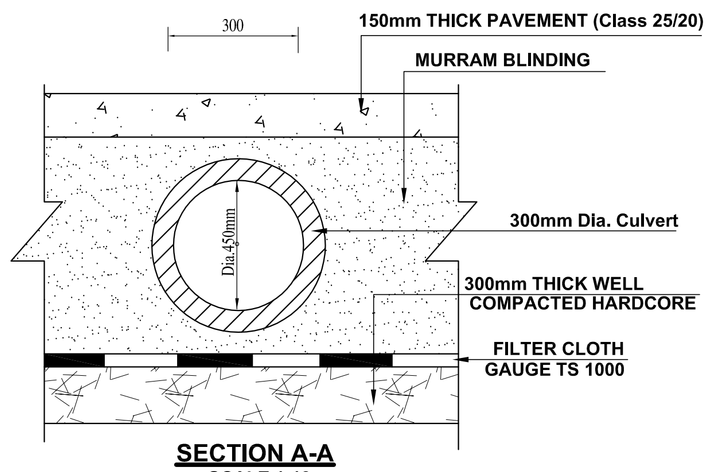


INVERT BLOCK DRAIN
DIAMETER 300mm
SCALE 1:10



PIER SECTION @ 2.5m c/c

PLAN AT PIER AREA
SECTION 2-2



SECTION A-A
SCALE 1:10

NOTES

1. This drawing must be read in conjuction with any other relevant drawings.
2. The Contractor must confirm all dimensions on site before commencing any work.
3. All dimensions are in millimetres unless specified otherwise
4. Concrete cover to reinforcement steel to be: = 50mm
5. Concrete strength for structural concrete members to be class 25/20
6. Square twisted steel reinforcement bars to B.S.4461 are denoted " Y ".
7. Mild steel reinforcement bars to B.S.4449 are denoted " R ".
8. All steel reinforcement must be approved by the Structural Engineer before casting.
9. All excavation work to be inspected and approved by the Structural Engineer before concreting.
10. Weep holes on wall to be at 0.6m. intervals vertical and 3m c/c horizontally.
12. Only figured dimensions to be taken from this drawing.
13. All structural steel to conform to grade 43 Steel BS 449 or its equivalent.
14. Drains at 20m and at all natural Drainage

ISSUES

DATE	TO	APPLICATION	TO

REVISIONS

No.	DATE	BY	DESCRIPTIONS	GRP. LDR.	C.S. ENG.

REFERENCE DRAWINGS

No.	DESCRIPTIONS

CLIENT: M.O.P.W

JOB No.:

PROJECT TITLE

CONSTRUCTION OF A SEAWALL AT THE VASCO DA GAMA PILLAR

DRAWING TITLE

1. SEAWALL SECTION
2. DRAINAGE DETAIL

C1/Sfb		
M.O.P.W.	DRG No.	SD/D13/8111A/CIV08
	FILE No.	
SCALE(S) 1:10, 1:25,1:50		FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING

APPROVED BY

THE CHIEF ENGINEER (STRUCTURAL), M.O.P.W.

	NAME	SIGNATURE	DATE
DRAWN			
DESIGNED			
SUPT ENG			
CHIEF SUPT. ENG. P. SUPT. ENG.			

STATE DEPARTMENT OF PUBLIC WORKS

STRUCTURAL DEPARTMENT

HERITAGE IMPACT ASSESSMENT FOR THE CONSTRUCTION OF A SEAWALL AT VASCO DA GAMA PILLAR, MALINDI, KILIFI COUNTY, KENYA

May, 2020

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LIST OF APPENDICES

LIST OF ABBREVIATIONS AND ACRONYMS

1. A. D.....After Christ
2. B.A. ..... Bachelor of Arts
3. C..... Celsius
4. EIA..... Environmental Impact Assessment
5. EMCA.....Environmental Management and Cordination Act
6. GPS .....Geographical Information System
7. H.I. A ..... Heritage Impact Assessment
8. KM.....Kilometer
9. KMA ..... Kenya Maritime Authority
10. KPA.....Kenya Ports Authority
11. M.A ..... Masters of Archaeology
12. M.....Meter
13. NMHA ..... National Museums and Heritage Act
14. NMK .....National Museums of Kenya
15. UNESCO ..... United Nations Education Scientific and Cultural Organization
16. W.....West

EXECUTIVE SUMMARY

The Vasco da Gama Seawall Heritage Impact Assessment aims at constructing a protective seawall at the National Monument of Vasco da Gama Pillar, in Malindi to protect the site from threats of sea waves. This study arose as an intervention to survey for and document the cultural resources on the area proposed for the Seawall Project. The HIA covered several components including terrestrial archaeology, socio cultural heritage and underwater cultural heritage impact assessments. This report outlines the heritage resources within the project area and highlights salient issues associated with this heritage. These issues include impacts, mitigation and conservation of the cultural heritage resources in the course of the Seawall implementation. Important mitigation and conservation activities to be undertaken include rescue of archaeological resources and In-Situ preservation of the underwater cultural heritage within the project area. These are presented in detail within the chapter on mitigations.

ACKNOWLEDGEMENT

We would like to thank the National Museums of Kenya personnel including the Director General without whose support this assessment would not have been possible. Dr. Caesar Bita, the Head of Coastal archaeology is appreciated for supervising the study. We thank the Malindi Museum staff: Haji Mohamed, Omar Abdalla, Mbita Israel, Ruth Moses and Brian Nyambu who provided archival information for this study.

This work could not have been complete without the intense input of the divers who bore the poorest underwater visibility, dangers of working underwater and the merciless sea conditions during the fieldwork. Others are tour and hotel operators, the Beach Management Unit at Baobab including their boat builders and fishermen for their valuable assistance and input. All the other stakeholders including Vasco da Gama residents, Malindi Museums Society, representation from tour operators and residents of Malindi who were involved at different stages of the study are acknowledged for their support.

1. INTRODUCTION

A Heritage Impact Assessment (HIA) for the Vasco da Gama Seawall, in Malindi, Kilifi County has been completed. This study was an intervention to survey for and document the cultural heritage on the area proposed for the Seawall Project as well as identify projects impacts and propose mitigation measures for the protection of this heritage. The area covered in this study runs 700m east and 200m north, south and west of the Pillar. The study has established that the area around the Pillar has a lot of cultural heritage on land and underwater that is likely to be negatively affected by the seawall project. It has also been established the project is close to the Portuguese Chapel, one the prominent historical monument in the region (Plate 2 and Appendix 3 Plate 36). This monument however will not be affected by the seawall project. On this basis the study has proposed a number of mitigation measures to offset the negative impacts to this cultural heritage. Mitigations proposed include documentation and retrieval through archaeological excavation and in-situ preservation for some of the identified underwater cultural heritage. It has also recommended on-site monitoring during the seawall construction to collect any other cultural materials that may be exposed. Similarly, a post monitoring plan and management of collected cultural artifacts has been proposed.

1.1. HERITAGE IMPACT ASSESSMENT

Heritage Impact Assessment draws attention of a project developer to the negative effects of a proposed development. It also seeks to suggest mitigation measures against negative effects of the proposed project to cultural heritage resources before such a development project can be implemented. Cultural heritage includes tangible resources such as archaeological sites and objects, architectural buildings, memorial / sacred sites and objects as well as intangible ones such as rituals, myths, legends, folklore, music and dance among others. Strategies that aim at protection, conservation and management of heritage target these resources. However, it is unfortunate that most project developers either have no knowledge of, or consider it as an irrelevant factor in national economic development. It is also notable that environmentalists (licensed Environmental Impact Assessment and Audit experts) in most cases ignore heritage concerns in their assessment of impacts of proposed development projects. Therefore, cultural impact assessment comes in to fill the gap left by the environmentalists. HIA is therefore an important tool of not only cultural resource management, but also environmental conservation.

HIA studies identify through scientific means the extent and range of cultural heritage on a site of a proposed development and proposes rafts of mitigation measures to offset the negative impacts to the cultural heritage. These in most cases have included documentation, rescue excavation, In-Situ preservation, and relocation of the cultural asset and in extreme cases, relocation or abandonment of a project. The collected archaeological record of the place to be affected is rescued for posterity through conservation in national repositories and museums and can be accessed for exhibitions and scholarship. In the case of Vasco da Gama Pillar National Monument, Heritage Impact Assessment will be used to evaluate the impact of the proposed seawall construction on cultural heritage around the monument. These include impacts to the heritage in the foreshore, the cliff, intertidal and the underwater.

1.2: LEGAL FRAMEWORK FOR CONDUCTING HERITAGE IMPACT ASSESSMENT

The legal basis of Heritage Impact Assessment derives from not only municipal or state legislations, but also from the international conventions ratified by Kenya as State Party and professional "best principles and practices" of archaeological resource management (Odiaua et al 2010; UNESCO 2010). The first set of legal principles and laws for conservation of heritage can be inferred in the preamble to the Kenya Constitution, in which the people of Kenya commit themselves to respect and recognize environment as national heritage and promise to sustain it for the benefit of posterity: "*We the people of Kenya……respectful of the environment, which is our heritage, and, determined to sustain it for the benefit of future generations"* (Kenya Republic 2010). In section 42(a) the constitution, establishes clean and healthy environment including its protection and conservation for the present and future generations as a fundamental human right. While Section 69(1e) assigns the State powers to establish systems of environmental impact assessment, environmental audits and monitoring. But again, Section 69(2) assigns everyone with the duty to cooperate with state organs and other persons to protect and conserve environment and ensure sustainability in development and use of natural resources (see the Constitution of Kenya, Section 42(a), 69 (1e) and 69(2) (Kenya Republic 2010).

The second set of legal framework is provided by Section 5(1n) of National Museums and Heritage Act, 2006. In this statute, the National Museums of Kenya as the custodian of natural and cultural heritage is given powers to ensure that environmental impact assessment (EIA) for any planned development project is carried out. The assessment study from the NMK perspective

should focus on any developmental activity that poses negative impact to cultural heritage. Negative impact to cultural heritage includes destruction, damage and threats to integrity and significance. Sacred places and sites or objects of archaeological and paleontological interest (antiquities) are known to occur within the natural physical environments and thus this leads to the conservationist and archaeological thesis that "every parcel of land has potential for archaeological heritage, unless proven otherwise, through archaeological scientific study". In the letter and spirit of this statute NMK may formulate sound policies and actions to regulate conservation and management of heritage resources. An HIA study therefore becomes a mandatory statutory requirement for any development about to take place on heritage site or near the surrounding areas (Kenya Republic 2006).

The third set of laws is provided by the Environmental Management and Coordination Act, (EMCA) 1999. This statute sets out the responsibilities and procedures for conducting environmental assessments. Some guidelines and regulations are further established by this Act (see EIA Guidelines and Administrative Procedures, Kenya Republic 2002). In addition, the law clearly makes EIA mandatory for all development projects whether private, public, individual or corporate and allows for Lead Agencies to make submissions on concerns arising from their mandate or lines of work. EMCA further makes it clear, on the cost of conducting an EIA. For instance, section 58 (2) states: "… the proponent of a project shall undertake…at his (or her) own expense an environmental impact assessment study……." Thus it is evident that the development project proponent has to meet the cost of conducting the Environmental Impact Assessment (Kenya Republic 1999).

The fourth set of laws is derived from Section 47(1), (2) and (3) of the Physical Planning Act 1996 of the laws of Kenya (Kenya Republic, 1996). This legal tool prohibits alteration, demolition and extension of buildings with architectural value, and provides that all regional and development plans, take into account all declared heritage or heritage resource deemed to have been declared under National Museums and Heritage Act, 2006. Finally, the fifth set of laws comes from international conventions to which Kenya is State Party. For instance, the UNESCO Convention on world natural and cultural heritage 1972, particularly in article 4 provides that State Parties identify, protect, conserve, present and transmit cultural and natural heritage to future generations. Similarly, article 5(c) empowers the State Party to develop scientific, technical studies or research or formulate operation methods that would enable it counteract the

dangers threatening cultural and natural heritage. The UNESCO Conventions on protection of tangible and intangible heritage, Sites and Monuments (these have been ratified by Kenya), provides professional guidelines for all activities directed at historical sites and monuments, tangible and intangible cultural heritage (www.unesco.org/culture/laws).

In conclusion, it can therefore be seen that this heritage impact assessment for the construction of a retaining seawall at Vasco da Gama pillar, Malindi, Kenya is well covered by the provisions of all these sets of National legislations and International Conventions.

1.3: CHALLENGES

Although the study was completed successfully, several challenges were encountered in the field. The intertidal work depended entirely on the ocean tides. It is impossible to work in the sea at the site of the Pillar due to the dangerous waves, hence all HIA activities were planned during low tides. These tides sometimes occurred very early in the morning leading to delays in fieldwork. Further, this work was carried out during the period of Covid -19 pandemic when the government had issued restrictions on travel and public meetings. One-on-one engagements were done by asking the concerned to come to the Pillar. For NMK personnel, engagements were undertaken at Malindi Museum (Plate 30, Appendix 5), rather observing social distances.

2.0: TERMS OF REFERENCE FOR VASCO DA GAMA HERITAGE IMPACT ASSESSMENT

On the basis of cultural heritage conservation concerns and legal obligations, Heritage Impact Assessment study for the Vasco da Gama Pillar (herein referred to as Pillar) Seawall was undertaken under three main objectives:

2.1: SURVEYAND DOCUMENTATION OF CULTURAL HERITAGE

This objective sought to i*dentify the extent and range of cultural and archaeological heritage resources on the site of the proposed seawall development.* It included terrestrial and underwater cultural heritage. Terrestrial covered archaeological exploration of the intertidal, immediate foreshore and headland on which Vasco da Gama pillar stands. A terrestrial archaeological

survey on the landward side, intertidal area and the cliff on which the Pillar stands was undertaken with a view to record data that would otherwise be destroyed by the sea wall construction. This objective also carried out identification of underwater cultural heritage in the eastern side of the Pillar up to 700m offshore. In marine literature, the inter-tidal zone is defined as the area of seashore situated between the high tide and low tide mark. The region just above is the foreshore zone. An underwater archaeological survey was undertaken to locate and document any other archaeological and cultural heritage materials in the immediate off shore and associated artifacts from ancient shipwrecks before the project commences.

2.2: IDENTIFY IMPACTS TO CULTURAL HERITAGE

This objective sought to examine the project and identify the possible impacts to cultural heritage as identified in objective one. This is to also include impacts that may occur during project implementation and after. It included impact prediction as may occur during project implementation and after. Such entails activities during construction such as excavations, trenching and or drilling that is likely to affect cultural heritage in the immediate foreshore, intertidal and the immediate underwater.

2.3: SUGGEST MITIGATION FOR IMPACTS TO CULTURAL HERITAGE

The aim of this objective was to suggest based on the findings of objective one and two, mitigations measures for the irreversible negative impacts on cultural heritage. For instance, salvage and rescue cultural objects within the development area and or complete archaeological documentation and excavation of heritage that cannot be salvaged or relocated.

2.4: MONITORING PLANS

This aimed as suggesting monitoring plans during and after project works including management and storage of recovered cultural artifacts. After the impact assessment, a plan to monitor the underwater cultural heritage has been developed as well as plans for curation, management and storage of all recovered materials. Materials collected would be handed over to National Museums of Kenya for with appropriate arrangements made to ensure these are well curated for better management and storage under appropriate conditions.

3: PHYSICAL SETTING

The Seawall project is set in the shores of Vasco da Gama Pillar located on the south eastern side of Malindi Town. The town of Malindi is located about 120 kilometres northeast of Mombasa and about 250 km south of Lamu. It is an administrative district town, the second largest after Mombasa in coastal Kenya and forms a sub-county by the same name. Along Malindi Bay, coastal terraces, dunes, cliffs and beach ridges are among the most important geomorphologic features indicative of the quaternary sea level changes. These occur as distinctive platforms in stepwise manner in many places along the coast of Kenya (Bita 2012). Coastal terraces in Kenya that have been recognized by various work are Matuga, Ganda, Kilifi, Malindi, Shelly beach, Leven Reef and the submarine platforms (Ase 1981; 1987; Dunbar 2007). Casual observation of Malindi shoreline shows Malindi bay has experienced tremendous changes. These changes include, higher propagation rate in the southern part of Sabaki (where the Pillar is located) compared to the north. This difference may reflect higher supply of sediment by the Sabaki River during the north - east monsoon. The fluvial sediments result from flood events and are deposited in the form of offshore bars. These sand fluvial from the Sabaki is responsible for the coastal propagation and the formation of extensive transgressive sand dunes between Malindi and Ngomeni (Abuodha 1989; 1998; 2003; Munyao et al 2003). They are also responsible for the 200m of new land created by the sea recession between Vasco da Gama Pillar and Malindi Heritage Complex building (Bita 2012).

3.1: The History of Malindi Town

Malindi is one of Kenya's ancient coastal towns that has played a very important role in world history and particularly in shaping the history of the East African coast. It is a town that has hosted a great many foreigners in the historical times, Arabs, Indians, Chinese, and Europeans all who had in one way or another some influence in the town. They introduced new architecture, religious beliefs, trade contacts, settlement and new crops. According to Wandibba (2003), the Persians had a long presence as rulers in the East African coast for almost five centuries leaving behind visible architecture and civilization (Bita 2006; 2005; 2008; 2012). The town appears in Chinese records of the 9th century AD (Freeman-Grenville 1975; Kirkman 1964) and was visited and described by Arabs and Portuguese visitors in the 12^{th} - 15^{th} centuries AD respectively (Freeman-Grenville 1975; Inghams 1962; Ross 1995; Hall 1996; Sassoon

1980). By the 15th century AD for instance, the Chinese explorer *Zheng He* is said to have visited the town where he was given a giraffe as a present by the Arab Malindi ruler (Kirkman 1964).

The town of Malindi is mentioned in many ancient literatures. A 9th century Chinese scholar describes the 'contrast between the pastoral Somali, who grew no grain and drank the milk and blood of their cattle, and the wild blacks of *Mo Lin',* which some scholars identify with modern Malindi (Martin 1973; 1975; Martin and Martin 1978). The Arab geographer, Al Idrisi (1100-1165), writes of a town 'on the edge of the sea at the mouth of a river… *It is a large town in which the inhabitants engage in hunting and fishing'* (Hourani 1963). Although, there are doubts as to whether this could be Malindi, if the Sabaki River has been in its present location since 1500, as Portuguese accounts show this could be true. Oliver and Fage (1962) state that 'Malindi and Mombasa had been known at least since the 12th century for their mines of highly concentrated iron ore, which was exported to India for the manufacture of steel blades for swords and daggers'. Martin (1973) argues that the archaeological evidence found in Malindi support the contention that the town was founded in the 13th century (Hall 1996).

There is also a geographically accurate account of Malindi given by Prince Abu al-Fida (1273-1331), who sites the town of Malindi at a latitude of 2 degrees 50' (Hourani 1963). He describes a nearby river, which originates many kilometres away to the West, which is a reliable reference to the Sabaki River (Martin 1973; Bita,2012). Another source of traditional history called the 'Book of the Zenj' (Inghams 1962), claims that Malindi was founded by people from Iraq in the 7th and 8th centuries, and describes a visit by Khalif Mamum in AD 827. However, The Chinese geography known as the Yu-yang-tsa-tsu written by the scholar Tuan Ch'eng-shih and published in 1060, mentions Malindi (Oliver and Fage 1962). From oral interviews, Malindi Town is said to have started in Mambrui, a village 11km north of the present Malindi (Bita 2012). This village located near the Sabaki River, is said to have had a nice harbour (now covered by sand due to siltation from the river), has the oldest Asian graves and mosques believed to have been here before arrival of Vasco da Gama. Archaeological excavation by Bita (2012) recovered iron age pottery dating to the 750 AD supporting this assertion.

3.2: History of Vasco da Gama Pillar

The 15th century was an era of worldwide exploration by Portugal, and early in the century a Portuguese King had conceived the idea of commemorating visits of Portuguese vessels to different domains by erecting a pillar (known as a padrao) surmounted by a cross and embellished with the Portuguese court of arms. In 1497, King Dorn Manuel of Portugal appointed Vasco da Gama to command a fleet of four ships to proceed to India via the southern and eastern coasts of Africa in search of the famous spice islands of the Far East. The fleet left Portugal on the 8th July, 1497, and after many adventures, anchored off Malindi on Easter Sunday, the 15th April, 1498. The visit lasted for nine days and the fleet was well received by the Sultan of Malindi with supplies of fresh fruit and vegetables being made readily available (Martin 1973; 1975; Martin and Martin 1978).

It is probably the warm welcome that Da Gama received on this occasion which made him decide to visit Malindi again on his return voyage in 1499, and his sailors were allowed to erect the Pillar and cross on the high ground near the Sultan's palace on the hilly area above the present jetty (probably near the present day Phallic pillar tombs), possibly as a leading marker to guide future seafarers). The cross was made of Lisbon limestone and bore the court of arms of Portugal (still visible). By then Malindi town was small and enclosed by a wall, with a few houses and mosques located outside the wall and all of the Arabs living within the town wall. In view to the odium the Pillar and Cross excited within the majority Muslims, (due to its Christian connotation), it was taken down and later re-erected outside the Malindi town wall (probably near the Portuguese Chapel) after the Portuguese had made Malindi their northern Africa headquarters around 1512. It is argued that the Pillar was fallen down in the mid-16th century but was re-erected, on its present location on the headland, sometime before the Portuguese moved to Mombasa (Martin 1973; 1975; Martin and Martin 1978).

In this exposed position the Pillar became weathered and eroded and in 1873, the English Captain Malcolm of HMS Briton decided it should be reinforced (Hall 1996; Ross 1995). He arranged for the protective concrete cone to be built, concealing the original pillar, which now supports the limestone cross. The Pillar stood the test of time until after independence when it was declared and gazetted as a National Monument in 1935 and placed under the management of the National Museums of Kenya. Vasco da Gama Pillar is the only known original *padrao*

out of several placed at various points around the African coastline by the Portuguese explorers. It is one of the most important monuments not only in the East African coast but the entire sub Saharan region. Today, the Pillar and Malindi town are inseparable with the being synonymous with the town (Ann Robertson Pers comms; Freddie Curatoro Pers. comms). Further, the relationship between the Pillar and the town of Malindi in terms of history and, culture and tourism has largely remained unchanged to this date (Haji Mohamed Pers. Comms; Omar Abdalla Pers. comms). The monument has been a significant symbol of the ancient interchange of cultural exchanges and international trade networks and influences between the African and western civilisations which are still visible in Malindi town today. Cultural heritage tourism is today a major global industry of the 21st Century and the town's remaining historic architectures, ruins and monuments such as Vasco da Gama Pillar remind us of this and offers highly attractive prospects at the interface between the urban and maritime environs (Bita 2005; 2017; 2008; 2018; 2019a).

Plate 1: *Vasco da Gama Pillar (Field Data May, 2020)*

3.3: PROPOSED HERITAGE IMPACT ASSESSMENT FOR THE CONSTRUCTION OF A SEAWALL AT VASCO DA GAMA PILLAR

The famous Vasco da Gama Pillar is built on a rocky promontory and over the years the coral rock on which it stands has been experiencing heavy wave action leading to weathering, breakage and collapse. The government of Kenya, undertook salvage interventions by building concrete abutments to support the rocky headland, however, these have too worn out and the rock base has collapsed in some sections, seriously threatening this national monument. This has prompted the government through National Museums of Kenya to seek for a permanent solution of a seawall. NMK plans to carry out a long term solution, consisting of construction of a sea wall. This more elaborate intervention requires an assessment of its impacts on cultural heritage at the project area (Kenya Republic 2002; 2006; 2010). The area covered in the heritage impact assessment study runs 700m east and 200m west, south and north of the Pillar (Plate 2).

Plate 2: *Vasco da Gama Heritage Impact Assessment Area of coverage (Field Data, May, 2020)*

3.3.1: Methodology

As mentioned earlier, this HIA had three objectives. Objectives one and two employed a methodology that involved maritime / underwater and land / terrestrial surveys. Terrestrial survey covered intertidal and foreshore pedestrian site walking, socio cultural survey involved one-one-interviews and site walking while maritime /underwater entailed underwater diver searches.

3.3.1.1: Terrestrial Archaeology Survey

Land survey entailed exploration of the intertidal and foreshore to document any cultural heritage in the area. It also sought to record ancient sites such as ancient moorings, bunkers, Jetties, sacred sites / shrines, fish landing and boat areas. This survey employed visual pedestrian or foot-walk technique to systematically observe and record potential archaeological deposits on the land surface in the project site.

3.3.1.2: Socio-Cultural Heritage Survey

A study around Vasco da Gama to identify and document cultural sites associated with community social significance such as shrines, ceremonial, burials was carried out. This covered the high cliff, huge rock boulders, caves and immediate foreshore and involved one-one interviews and visits to the sites with fishermen, locals and Museum caretakers.

3.3.1.3: Maritime and Underwater Heritage Survey

This involved exploration of the shoreline and underwater around Vasco da Gama pillar especially areas earmarked for drenching, construction and backfilling. It was carried out to document any submerged archaeological artifacts, features including shipwrecks, artifacts such as ship parts or cargo and or structures as well as any other submerged cultural heritage in the area. The methodology involved diver searches, subsea probing using metal probes (see appendix 3 plates 34-35) and underwater photography.

4: HERITAGE IMPACT ASSESSMENT

Objective one of this study sought to survey, identification and documentation the extent and range of cultural and archaeological heritage resources on the site of the proposed seawall development. A study to document the cultural heritage in the project area was undertaken covering terrestrial / intertidal archaeological survey, foreshore, the cliff and underwater.

4.1: HERITAGE RESOURCES / IMPACT ASSESSMENT FINDINGS

4.1.1: TERRESTRIAL ARCHAEOLOGY

A terrestrial archaeological survey on the cliff and landward side as well as on the intertidal areas was done with a view to record heritage that would otherwise be destroyed by the sea wall construction. This survey employed visual pedestrian or foot-walk technique to systematically observe and record potential archaeological deposits on the land surface. An archaeological team systematically walked through the 200m to the west and 200m to the east of the Pillar on the intertidal and foreshore area.

The intertidal area

This survey covered the area from the Pillar 200m westwards to the Baobab boat landing site near the Kilifi County fisheries office and again 200m eastwards to the reef offshore. The methodology used involved foot walking, taking notes and photography. This stretch of intertidal to the east is composed mainly of small rocks, seaweed and patches of sand matrix and medium sized depressions. To the west it is mainly sandy.

Plates 3-4: *The intertidal area at Vasco da Gama Pillar (left) and the two fringing reefs, right in the background (Field Data: Bita, April –May, 2020)*

Archaeological foot-walk survey of the inter-tidal zone, was executed at an arbitrary interval making observations and searching on surface for any observable present and past traces of human activities, artifacts and structures of historical significance between the high and low water marks with recordings done in digital photography. Some material of cultural heritage

significance was identified in the area east of the pillar mainly pottery. To the west of the pillar at baobab, the survey identified a boat landing site with several types of boats / vessels probably the ancient port of Malindi.

Plate 5: *Baobab boat landing from Vasco da Gama Pillar (Field Data, April-May 2020)*

Archaeological pottery scatters

The intertidal survey discovered three pieces of pottery that included 2 blue-on-white and one Islamic wares (Plate 6) about 75m east of the pillar (see appendix 4: Surface collected Pottery during the Heritage Impact Assessment study). An extended search however did not find any features such as walls that may be associated with this pottery. Since no occupation could occur in the open sea area, it is likely the pottery is from some submerged shipwreck or it was washed from the Baobab area near the Portuguese Chapel.

Plate 6: *Ceramics collected in the intertidal area at Vasco da Gama Pillar (Field Data April-May, 2020)*

Findings from foreshore and cliff survey

The general topography of the foreshore area to the southern side of the Pillar is of high coral cliff and light bush patches while it is gently rises on the western side. The coral cliff is eroded and heavily broken. On the west is the boat landing site with some acacia bushes. The entire area above the foreshore is heavily built with private homes, offices, villas, hotels and restaurants. A foot walking survey of this area of the Pillar was carried to out to explore for existence of ancient features and sites. During construction of the wall, the foreshore will serve as the passage for traffic supplying materials to the site. In this case, any cultural materials on this area will be trampled by the machines, broken and destroyed completely hence lost forever.

Plate 7-8: *The high coral cliff and caves at Pillar heavily broken by the waves (Field Data April-May, 2020)*

West of the Pillar around the County fisheries office near the Portuguese Chapel was found the Baoba boat landing site where some pottery scatter was also recorded. Near the Pillar itself, to the south, is the home of Mr. Aramando Tanzini, the immediate neighbour, who confirmed that he always finds pottery inside his compound during construction. No sites, features or sites of community social significance were found in the foreshore survey.

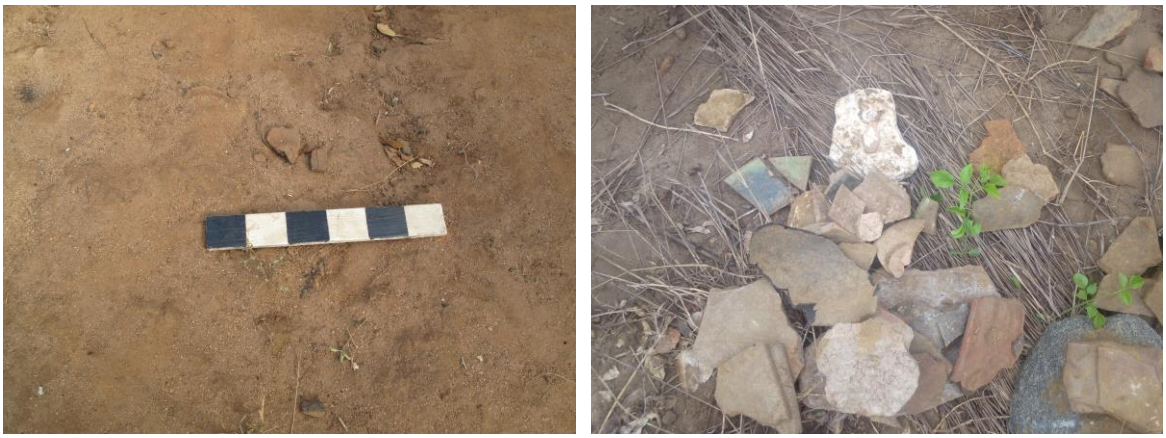


Plate 9-10: *Pottery concentrations at the Baobab boat landing west of Vasco da Gama Pillar (Field Data: April- May, 2020)*

Plate 11-12: *Decorated pottery from the Baobab boat landing site (Field Data: April- May, 2020)*

A boat landing site is a traditional port (Salim Abdalla Shee Pers. Comms; Issao Bilali Pers. Comms). Archaeologically, it is these landing sites that eventually developed into major ports and harbours in use today. The Baobab boat landing site may have been in use during the Portuguese or Arab period probably as the ancient port of the 14th -16th centuries. As such pottery found around this site and its proximity to the Portuguese Chapel suggest it was a settled

area probably with port facilities such as moorings, docks, custom houses, yards and godowns. As such, the surface pottery indicates deeper subsurface archaeology.

Plate 13-14: *Boat repair at foreshore at Baobab boat landing site (Field Data: April - May, 2020)*

4.1.2: SOCIO-CULTURAL HERITAGE SURVEY

This study examined the high cliff, huge rock boulders, caves (Plates 7-8**)** as well as the immediate foreshore. There were no sites of community social significance identified in the study (Mbita, Omar, Nyambu, Aramando, Salim, Issao, Shekue, Pers. Comm, May 2020)

4.1.3: UNDERWATER CULTURAL HERITAGE SURVEY

The Portuguese, during their occupation of the East African Coast, are known to have lost a number of ships. Reported Portuguese shipwrecks, lost in Malindi and not yet found include *Nossa Senhora da Graca* which is suspected to have sunk in the late 15th century, *Nossa Senhora do Guadalupe* which Portuguese records report was part of five ships commanded by Joao Soares Henriques sailing to India and wrecked on 7th April 1614, *El Rei*, which was in a fleet of thirteen ships, sank on 8th March 1500 after an attack by Moorish vessels. Other non-Portuguese shipwrecks are a caravela under the command of Dom Fernando de Monroy that wrecked in Malindi in 1523. *Nairobi*, one of the Castle Class mine sweeping trawlers used by the British Admiralty was lost in Malindi in the First World War on 2nd December 1922. *Lavest*, built by a Spanish company in 1974, sank in Malindi on 26th April 1992 (Patience 2006; Bita; 2013a; 2013b 2015; 2018). Previous underwater archaeological surveys in Malindi have established existence of a number of shipwrecks many confirmed in the ancient Portuguese records (Bita 2014a; 2014b; 2018; Patience 2006). Although some have been found like the 16th Century, Ngomeni shipwreck, many are yet to be located (Bita 2014a 2014b; 2018; 2019b).

Underwater cultural heritage survey

The offshore immediately east of Vasco da Gama has two reefs, a small fringing reef about 200 m from the Pillar and a main reef, referred to as the Pillar Reef about 1000m away. The Pillar reef extends to join with the leopard reef to the south (See Plate 15). Vasco da Gama Pillar was a navigational landmark and the area between the two reefs was the only passage to the ancient Portuguese era Malindi port.

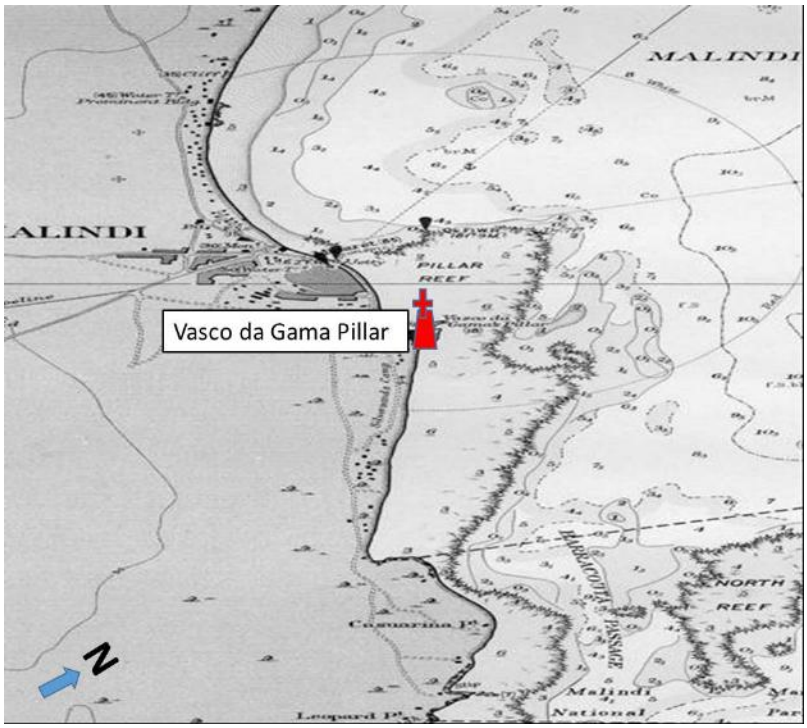


Plate. 15: *The bay of Malindi showing Pillar Reef and the two reefs where many ships are suspected to have wrecked (Bita, 2013a)*

A survey of the immediate underwater east of the Pillar was done to document any submerged underwater cultural heritage. This involved using metal probes to gauge the sediment cover and observing currents to determine vulnerability of the sites during and after the seawall construction. Diver searches were undertaken up to 700m from the Pillar to check for any shipwrecks, ship parts and or associated cargo. A number of objects were realised that confirm the area as rich in underwater cultural heritage. These include ancient wood pieces heavily concreted in coral (likely to be shipwreck parts), pottery on the see bed (Plates 16-18 and 26 in Appendix 3) and pottery concreted in coral occurring in the area between the two fringing reefs (Mohamed Saidi; Shekau Abubakar; Pers. comm.). This was also confirmed by local fishermen

who reported collecting pottery underwater between the reefs. The findings are spread out in an area of 30m². Further, the fishermen indicated sighting a wooden shipwreck off Leopard reef, containing green and brown ceramics. In addition, locals have claimed to have been collecting pottery on the access road from Scoprpio villa hotel to and around Silver Sands beach near Vasco da Gama Pillar (Israel Mbita, Pers. comm; Ajela Ngunzi, pers. Comm; Nyambu Brian, Pers. Comm; Ann Robertson Pers comms).

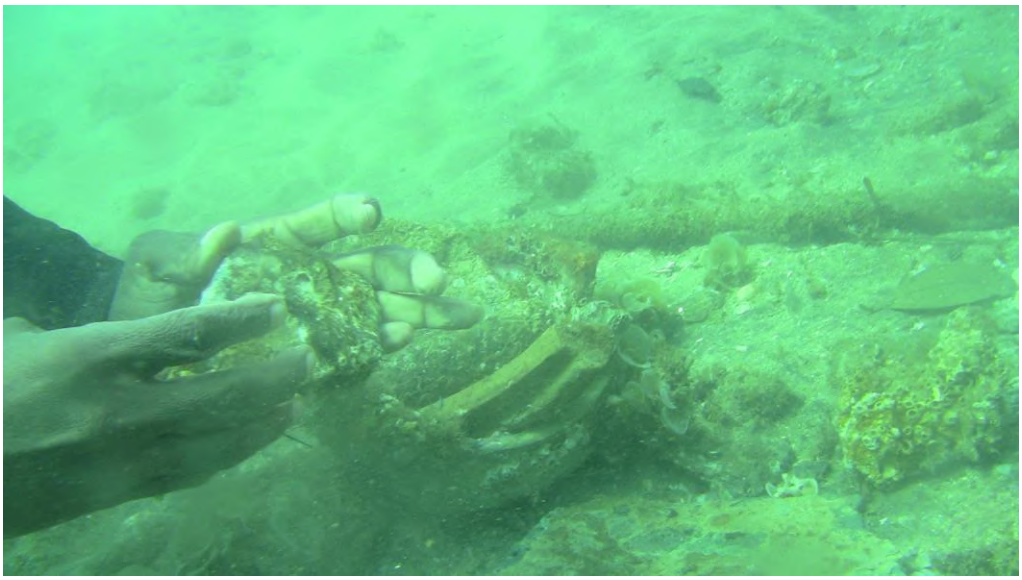


Plate 16: *Pottery concreted in coral underwater at the Pillar (Field Data: April- May, 2020)*

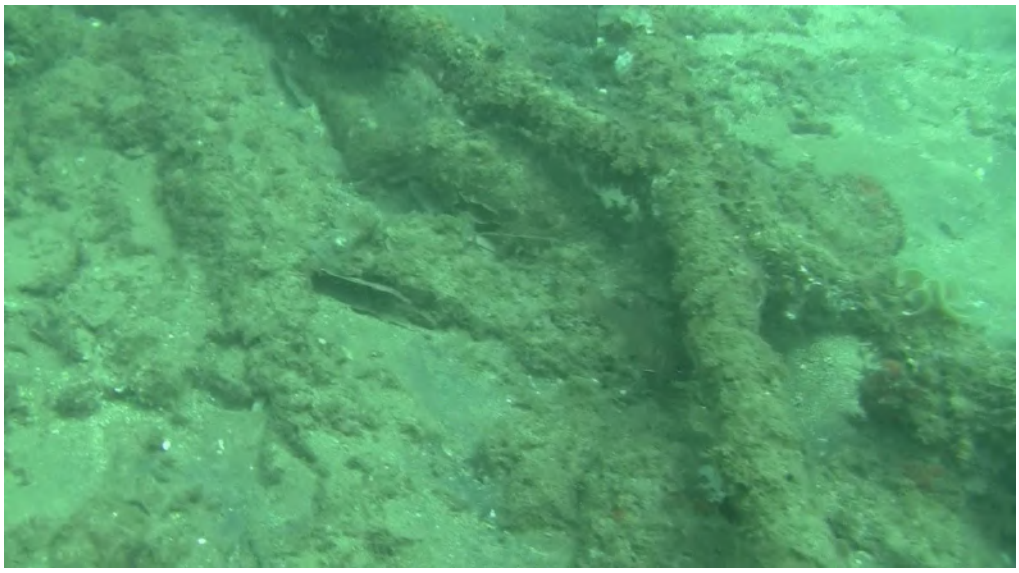


Plate 17: *Concentration of wood concreted in coral underwater at Vasco da Gama Pillar (Field Data: April- May, 2020)*

Plate 18: *A large piece of open earthenware bowl in underwater (Field Data: April - May, 2020)*

4.2: IDENTIFY THE POSSIBLE IMPACTS TO CULTURAL HERITAGE

This objective sought to examine the project and identify the possible impacts to cultural heritage as identified in objective one. The objective included impact prediction as may occur during project implementation and after the wall has been built. Activities identified to likely impact on cultural heritage during construction include excavations, trenching, drilling and transportation. This will affect cultural heritage in the immediate foreshore, intertidal and the immediate underwater. Activities that will affect heritage after the project include wave / tidal action resulting from backwash and or breakwater from the seawall. This will affect important underwater cultural heritage.

4.2.1. Impact to terrestrial Archaeology

The seawall will be built in the intertidal of the Pillar, and being a permanent structure, any cultural material beneath will permanently be covered and lost forever. The following are the predicted negative impacts by the project to terrestrial heritage.

Impact during construction of the seawall

- **Along areas marked for construction of the wall:** The wall will be built on the eastern shores of the Pillar, as such, during construction, destruction or damage to heritage will result from trenching, drilling and backfilling. Archaeological pottery and wood pieces found in the eastern side of the pillar will be destroyed and archaeological contexts lost.

- **On the intertidal area:** Pottery concentrations identified in the intertidal on the eastern side will be lost through three ways: They may be broken by machinery during construction; could be buried completely by spoils from trenching and backfilling or can be washed further away into the deep sea by the sea turbulence from the construction works. The same will befall pottery on the western side of the pillar.

- **On the foreshore:** Pottery at Mr. Tanzini compound and that locals claim to have found on the passage way to the Pillar suggests that the area may have been settled in the ancient time. In this case, any heavy machines moving around are likely to expose more pottery on the passageways destroying their archaeology. The baobab boat site will experience greater sand deposition due to the increased turbulence at the construction in effect further burying any archaeological material. No anticipated impact to the maritime activities at the boat landing site.

Impact after construction of the seawall

The main impact after construction will mainly be on the pottery concentration and boat building site. The completed seawall will cause an imbalance in the wave and currents dynamics at the Pillar since the wall barrier will prevent waves reaching their final stretch in the shore. The resultant tidal action will lead to greater sediment movement which has the effect of either covering the potteries or washing them further away. Alternatively, it may lead to greater erosion at the Baobab boat landing site further exposing and destroying archaeology.

4.2.2: Predicted Impacts to the Underwater Cultural Heritage

The construction of the seawall will affect underwater cultural heritage in a number of ways.

Impacts during Construction of the seawall

- During implementation, there will be debris movement from the construction site. These will be transported by sea action and are likely to completely bury the wood and pottery concentrations identified in the underwater. Again, the same debris can cause abrasion to the fragile wood and pottery hence destroying archaeological data. In addition, anchors from construction machines will be dragged by currents and cause breakage to the artifacts buried under the seabed.

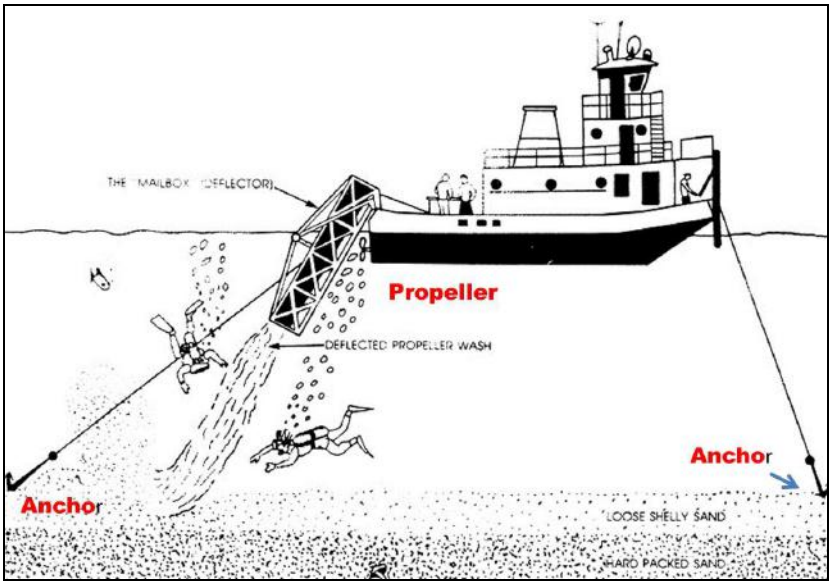


Plate 19: *Illustration of impacts of how construction machines can damage underwater cultural materials (Bita, 2020).*

Impacts after Construction of the seawall

- The purpose of construction of the wall is to prevent strong waves from reaching the Monument and causing further damage. An understanding of tidal dynamics indicate that the completed wall will lead to an imbalance in the physical power of the waves and currents. This is due to the fact that the wall will prevent waves from reaching their final stretch in the shore. The resultant tidal action will lead to greater sediment movement

which has the effect of either covering or uncovering submerged archaeological materials. This has the same effect to the underwater concreted pottery and wood found in the underwater. This newly created sea energy will be far stronger than that caused during construction and will lead to higher erosion rate on the seabed further exposing artifacts. The exposed materials will be dragged on the sea floor by the receding backwash and wave causing abrasion and breakage with irreversible damage (Plate 20). Neverthless, sediment movement can lead to deposition over the exposed concreted wood and pottery causing a reburial. This reburial is a blessing since underwater cultural heritage tend to preserve better when fully buried underwater.

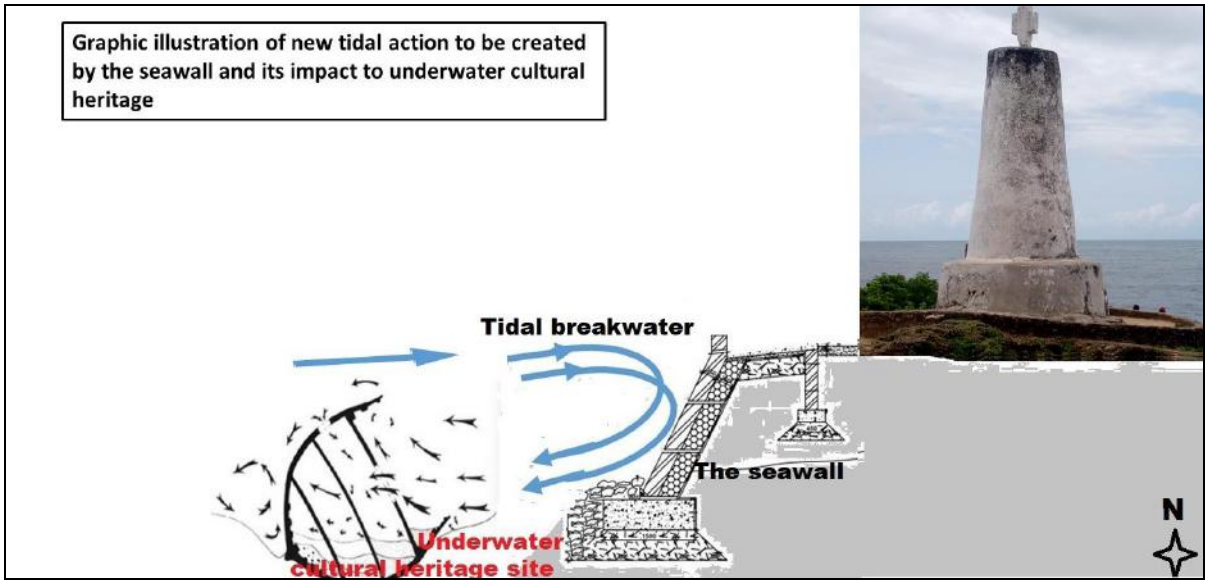


***Plate 20**: Impact of the newly introduced tidal action to underwater cultural heritage*

While reburial of underwater wooden materials may be lead to their better preservation, the same has the impact of introducing microorganisms that destroy wooden sites. Shipworms (Terredo) and wood borers are known to eat away ancient ship wood (Bita 2020). As such, sediment movement and building materials used at the seawall construction can introduce these organisms at the wood concentrations in the subsea.

4.3: MEASURES AND MITIGATIONS TO IMPACTS ON CULTURAL HERITAGE:

One of the objectives of the heritage impact assessment was to suggest based on the findings of objective one and two, measures and mitigations for the irreversible negative impacts on cultural heritage. Following identification of negative impacts of the seawall project to cultural heritage,

this study recommends mitigations to these impacts. The main mitigations recommended include complete archaeological excavation of heritage within the development area. For the concreted pottery and wood in the underwater, underwater preservation methodology of debris netting with sand bags is recommended as these await detailed underwater archaeological study.

4.3.1: Mitigation for Terrestrial Archaeology

The area along which the wall will be built was found to contain heritage that will be impacted negatively during construction and after. The pottery in the eastern and western intertidal area should be recovered before the project commences. An archaeological excavation should then be undertaken at Mr. Tanzini's house or the corner to the entrance to the Pillar, the likely route for machinery ferrying construction material (See Plate 24 and 25: Appendix 3). This will ensure recovery and documentation of all archaeology therein. The same should be done at the boat landing site west of the Pillar. To mitigate against loss of pottery in the concentrations, all foreshore pottery should be recovered to the Museum. Mitigation for terrestrial heritage will take 2 weeks (see mitigation work plan, pp 33).

4.3.2: Mitigation for impacts to underwater cultural heritage

As mentioned above, the seawall will affect the wood and pottery in concretion located in the underwater.

- **Mitigation for pottery:** Pottery is inorganic and cannot be destroyed when taken out of the water. Again, it is inexpensive to treat, conserve and restore. As such the large bowl piece and pottery in concretion should be retrieved for conservation treatment at the Museum.

- **Mitigation for concentrated wood in coral concretion:** Wood is organic and tends to get decay quickly once exposed to the outside. Further, it is very expensive to treat and restore. This HIA study therefore recommends that these be left in-situ and NMK can organise their detailed study and retrieval once they make arrangements for their conservation treatment. To mitigate against the impacts, these should be covered in a

debris net and sandbags. This is an inexpensive procedure since the materials occur in a small area of 30m².

Installation of Debris nets and sandbags on the wooden concentration

- Debris nets are the normal heavy duty netting used on scaffolding to protect pedestrians and traffic from falling debris during construction of high rise buildings. They have no negative effects to the marine environment and once applied they trap sediments and trigger sediment deposition on a shipwreck site, creating a mound over the site that permanently protects the site. The mound thus creates an anoxic environment that protects against Teredo and borers that destroy wooden artifacts. The sandbags will be used to hold the netting in place.

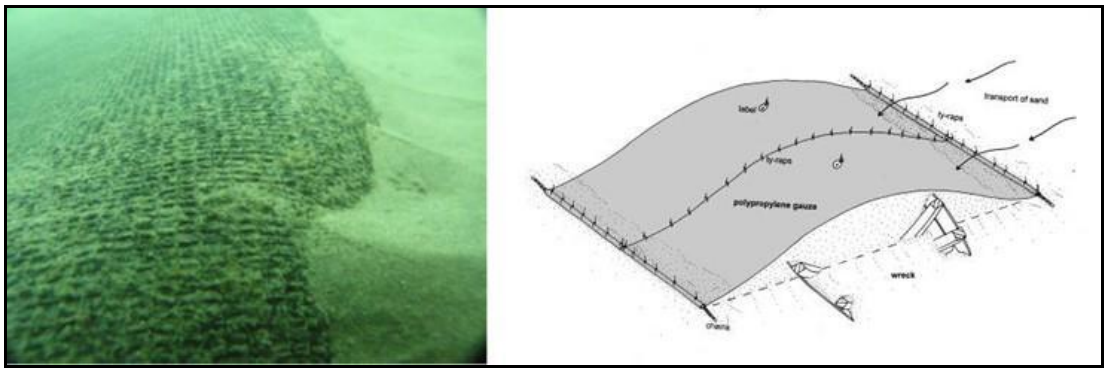
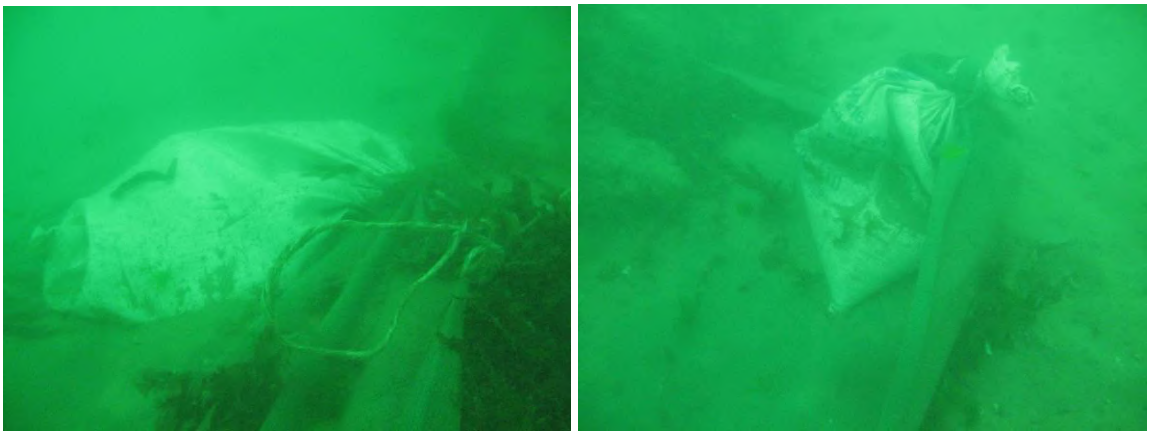


Plate 21: *Debris net as installed over an underwater cultural heritage site. (Source: Manders and Luth 2008)*

Debris nets have been used for In-Situ preservation of wooden shipwrecks in Kenya including the 17th century *Santa Antonio de Tanna* Shipwreck in Mombasa (Bita 2020). The key strengths in debris nets include durability, ability to reduce current speed and considerably reduce sediment movement which allows sediment deposition on a site. The other advantages are that they are not heavy, they are cheap (they are locally available), easy to repair and easy to gain access during monitoring. In addition, in the long run they create an artificial reef which further helps protect the submerged site. Debris nets are easy to install as they are simply fixed to the seabed either with long pegs which penetrate the seabed or heavy material such as anchor chains or sandbags. Mitigation for underwater heritage will take 3 weeks (see mitigation work plan, pp 33).



Plates 22-23: *Debris nets installed over Santa Antonio Shipwreck, Mombasa (Bita 2020)*

4.4: MONITORING PLANS AND POST PROJECT MANAGEMENT FOR COLLECTIONS RETRIEVED FROM THE IMPACT ASSESSMENT

Upon completion of the mitigation and the seawall construction commences, it is recommended that monitoring of the construction maintained. Although mitigation will have been undertaken for all cultural heritage identified in this study, it should be noted that other archaeological materials and or structures may be up-coming or revealed in any other area of the project area in the course of construction of the seawall. As noted above, during construction there will be increased sea water turbulence leading to increased sediment movement that can destroy underwater materials. Again as noted in the impacts analysis, construction tools can be dragged by currents exposing and destroying other heritage materials. As such, on-site monitoring will be needed to ensure recovery of all materials that may be exposed before they are destroyed.

Monitoring Procedure

After the HIA, monitoring of the seawall construction will continue to ensure recovery of any cultural material that may be unearthed during the construction works. The proposed monitoring procedure is as follows:

4.4.1: Monitoring Terrestrial Archaeology during construction

The monitoring procedure will involve:

- Holding awareness meetings with the civil engineers and contractors and machine operators to inform them about cultural heritage and its identification.
- Checking for and retrieval of any upcoming archaeological materials in the passage way used by machines transporting building materials to the Pillar.
- Checking for and retrieval of any upcoming archaeological materials in the intertidal during trenching and drilling.
    - An archaeologist to be closely monitoring the earth moving, land clearance and backfilling for signatures of archaeology
    - Taking notes, measurements and photos
    - Retrieving the exposed materials

4.4.2: Monitoring Underwater Cultural Heritage during construction

The procedure will involve:

- Holding awareness meetings with the civil engineers and contractors and machine operators to inform them about cultural heritage and its identification.
- Regular diver inspection of spoils drenched from the seabed on the site of the offshore construction.

  Divers and underwater archaeologists to check for upcoming materials at all underwater areas prior to trenching or drilling.
- Rescue and conservation of any upcoming material
- Changes to sediment and current movement in the site environment. This will be done by observing speeds and direction of currents as well as sediment transport during construction of the wall.
- Monitoring of the installed mitigation methodology on the wood concretion to ensure it is not damaged. This will involve monitoring:
    - The condition / situation after installation
    - Any changes on the installed methodology such as sediment deposition, stability of the debris nets. Debris nets should be able to ‘float’ or ‘wave’ in the water to trap sediment. As such this will be monitored constantly.
    - Sandbags will be checked for scour on the edges and displacement.

4.4.3. Post Project Monitoring

After the wall has been constructed, monitoring will be carried out for managing the changes to the underwater wooden concentration in coral concretion and the debris net mitigation. This will be undertaken after every six months. Monitoring will also cover the 700m stretch of seabed between the Pillar and the area with wood and pottery concretion to check for other cultural materials that may be exposed by erosion due to the changed tidal dynamics (see plate 20). This will be undertaken every after every three months by divers and underwater archaeologists. Monitoring of changes at the Baobab boat building site especially sand erosion for any archaeological materials that may be exposed should be carried out every six months. The post project monitoring will continue for 18 months and the frequency of the underwater cultural heritage monitoring will be done according to stability of the site with all changes noted communicated to National Museums of Kenya.

4.4.4. Management for collections from Impact assessment

On the basis of UNESCO conventions and National Museums and Heritage Act, the collected materials will require curation and proper storage in the National Museum repositories. As such, all materials collected during the impact assessment, during mitigation and post project monitoring shall be taken to Malindi Museum in Malindi for conservation treatment and detailed analysis (see Appendix 2, Table 1, plates 9-10, 28). Thereafter, they shall be handed over to the Department of Coastal Archaeological at Fort Jesus Museum for curation, better management and storage under appropriate facilities and conditions. These facilities will include: wooden trays, plastic crates, master inventory books, inventory cards.

5: SUMMARY AND RECOMMENDATIONS

This study has demonstrated that the proposed Vasco da Gama Seawall will be built in an area with important terrestrial and underwater cultural resources. The terrestrial archaeological survey has identified several areas with important cultural materials ranging mainly from ceramics concentrations to ancient boat landing sites. Maritime and underwater cultural heritage study has recorded ancient submerged wood concentrations and pottery that are likely shipwrecks and or ship cargo that are of archaeological significance. These resources being on the line of the

proposed Vasco da Gama Pillar Seawall shall be greatly impacted by the project. The study has identified the negative impacts to these heritage resources and recommends that mitigation by way of rescue, recording and documentation and In-Situ preservation for the underwater materials be undertaken.

These are summarized below.

1. Rescue Archaeology both on land and partly underwater on the historical materials discovered within the entire project site.
2. In-Situ preservation, by use of debris nets and sandbags, of the wood concentrations discovered underwater as they await detailed study and retrieval.
3. Conservation treatment of all cultural materials retrieved from underwater including curation and storage in appropriate conditions. This includes also materials from terrestrial rescue archaeology.
4. Heritage monitoring of the site during the works to make sure that any underground historical cultural resource including underwater are protected or rescued
5. Post project monitoring of the debris net mitigation to ensure protection of the In-Situ wooden concentration as well as the Baobab boat building site for any archaeological materials that may be exposed due to resultant tidal action.

6: CONCLUSION

This Heritage Impact Assessment for construction of a seawall at Vasco da Gama Pillar has identified the impacts of the project to the cultural heritage at the development area. It has also been established the project is close to the Portuguese Chapel, one the prominent historical monument in the region. This monument however will not be affected by the seawall project. The study has recommended a number of mitigation measures to ensure the heritage resources are protected. These once implemented will ensure the cultural heritage at Vasco da Gama is preserved for posterity.

7: MITIGATION BUDGET AND MONITORING WORKPLANS

	HIA OBJECTIVE /ACTIVITY	COST (In Kshs)
1	**Mitigation for Terrestrial archaeological**	
	• Archaeological rescue excavations ➢ Personnel ➢ Assorted materials	 ➢ 80,000/= ➢ 15,000/=
2	**Mitigation for Maritime and Underwater Cultural Heritage**	
	• Mitigation for foreshore and intertidal area • Mitigation for underwater cultural heritage ➢ Divers ➢ Equipment ➢ Hire boats	• 20,000/= ➢ 120,000/= ➢ 80,000/= ➢ 50,000/=
	• Installation of debris nets and sandbags on wood site ➢ Debris net ➢ Sand bags	 ➢ 45,000/= ➢ 15,000/=
3	**Monitoring**	
	• Awareness meetings with contractors and engineer	• 10,000/=
	• Rescue of upcoming materials	• 50,000/=
	• Collection curation, management and storage of artifacts	• 15,000/=
4	Post project monitoring	00
TOTAL		**500,000/=**

MITIGATION WORK PLAN FOR VASCO DA GAMA PILLAR SEAWALL CONSTRUCTION

		Time in weeks				
		Week 1	**Week 2**	**Week 3**	**Week 4**	
1	**Mitigation for Terrestrial archaeological**					
	• Archaeological rescue excavations					Land Archaeologist
2	**Mitigation for Underwater Cultural Heritage**					
	• Mitigation for intertidal area					Underwater Archaeologist
	• Installation of debris net and sandbags					
3	**Mitigation report**					Underwater Archaeologist
4	**Monitoring during construction**					
	• Meetings with contractors and engineer and rescue of upcoming heritage					
	• Collection curation, management and storage of artifacts					

NB: The fieldwork for the mitigation will cover a period of 4 weeks

POST PROJECT MONITORING WORKPLAN

ACTIVITY	**Time in months**																	
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Post project monitoring																		
• Seabed erosion and exposed cultural materials																		
• Debris net mitigation on concreted wood																		
• Changes at Baobab boat building site																		

NB:

- ❖ The Post project monitoring will last 18 months

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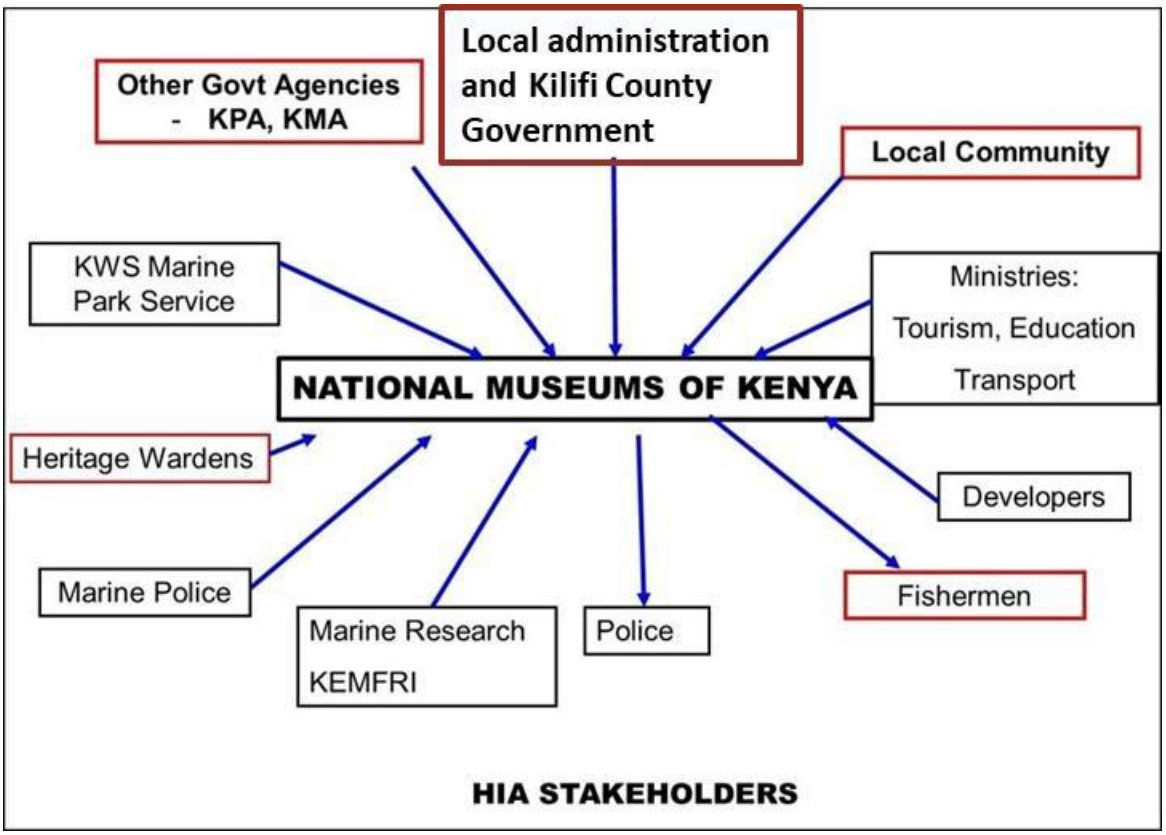
2. Mrs. Ann Robertson, Secretary, Malindi Museum Society 2 May 2020
3. Mr. Haji Mohamed, Curator, Malindi Museum 2 May 2020
4. Mr. Omar Abdalla, Administrator, Malindi Museum 2 May 2020
5. Mr. Mbita Israel, Ticket Clerk, Vasco da Gama Pillar, Malindi, 1 May 2020
6. Mr. Nyambu Brian, Conservator, Malindi Museum, Malindi, 1 May 2020
7. Aramando Tanzini, Resident Vasco da Gama, 1 May 2020
8. Mr. Salim Abdalla Shee, Boat builder, Malindi, 1 May 2020
9. Mr. Issao Bilali, Boat builder, Malindi, 1 May 2020
10. Ms. Ajela Ngunzi, Malindi Tourist Market, Malindi, 2 May 2020
11. Shekau Abubakar, Fisherman, Malindi, 1 May 2020

9: APPENDIX

Appendix 1: Heritage Impact Assessment Stakeholders



Appendix 2: Table 1: Surface collected Pottery during the Heritage Impact Assessment study

Category			Surface	Intertidal	Total
Pottery	Local	Decorated	6	0	6
		Undecorated	17	1	18
	European	1		1	1
	Islamic	3	2	1	3
	Chinese	5	3	1	5
Beads	0				0
Iron / Metal	0				0
Glass	0				0
Worked stone	0				0
Bone	0				0
Charcoal	0				0
				GRAND TOTAL	**33**

Appendix 3: Photo catalogue

***Plate 24**: Entrance corner to Vasco da Gama Pillar (Field Data, April 2020)*

***Plate 25**: Entrance passageway to Vasco da Gama Pillar (Field Data, April 2020)*

***Plate 26**: Pottery recorded underwater at the Pillar (Field Data, April 2020)*

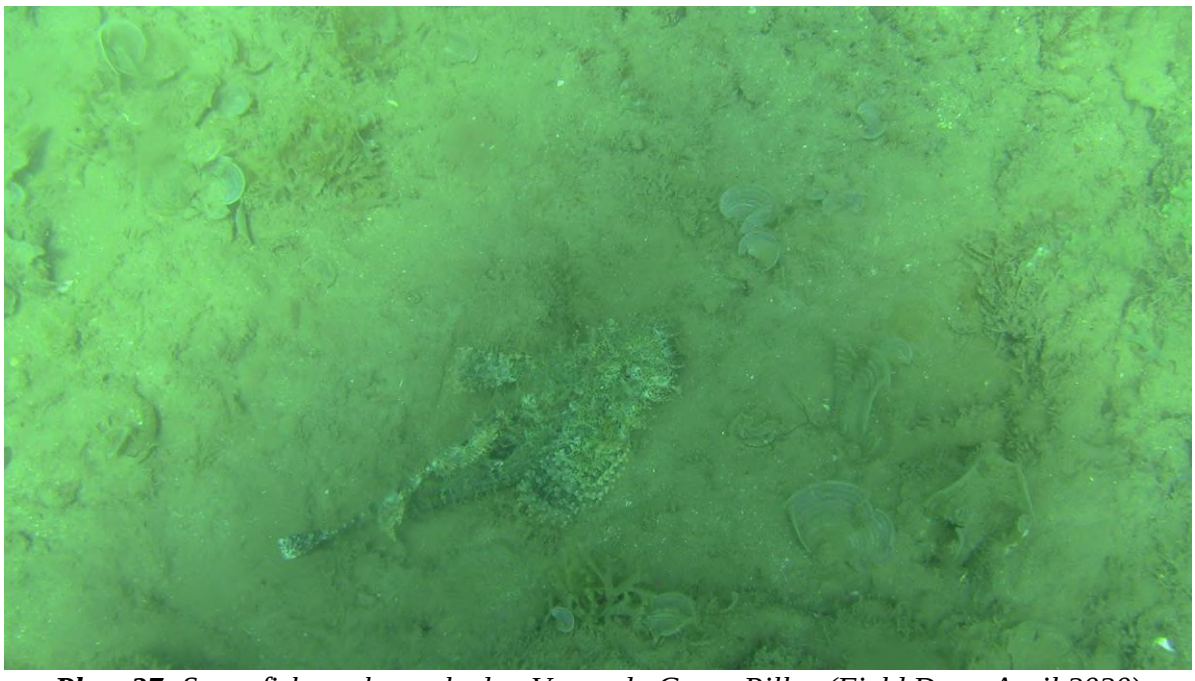


***Plate 27**: Stone fish on the seabed at Vasco da Gama Pillar (Field Data, April 2020)*

Plate 28: *Pottery from Baobab site (Field Data, April 2020)*

Plate 29: *Boats landed at Baobab with the Pillar in the background (Field Data, April 2020)*

Plate 30: *Meeting representatives of HIA stakeholders at Malindi Museum at Heritage Complex (Field Data, April 2020)*

Plate 31: *Visitors at Vasco da Gama Pillar (Field Data, April 2020)*

Plate 32: *Malindi Museum exhibition with an exhibition on Kenya's underwater cultural heritage Mr. Haji Mohamed, Museum Curator (Field Data, April 2020)*

Plate 33: *Divers surfacing from underwater survey (Field Data, April 2020)*

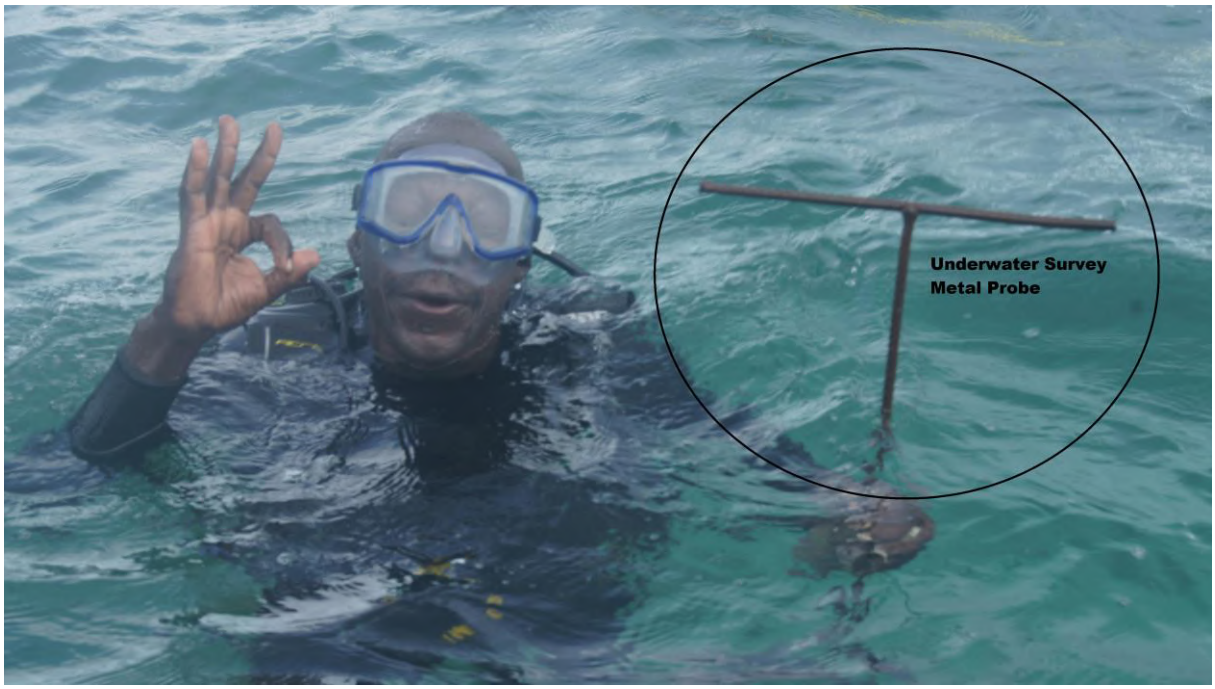


Plate 34: *Diver with a sea bed metal probe (Field Data, April 2020)*

Plate 35: *Preparing to dive for seabed probing (Field Data, April 2020)*

Plate 36: *The Portuguese Chapel (Field Data, April 2020)*

3. Public Consultation Forms

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: Click or tap here to enter text.	Obo
Age: Click or tap here to enter text.	42
Gender: Click or tap here to enter text.	M
Organization/Occupation: Click or tap here to enter text.	Fisherman
Mobile Phone Number: Click or tap here to enter text.	0798863014
Proximity to proposed project site: Click or tap here to enter text.	200m.

Cultural Significance

How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?

Always ☑ Regularly ☐ Rarely ☐

Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?

Yes ☑ No ☐

Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?

Yes ☑ No ☐

Socio-economic issues

Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?

Yes ☐ No ☑

Does the Vasco Da Gama Pillar provide heritage education for visitors?

Yes ☑ No ☐

Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?

Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. Not extend much. Height should be moderate.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text.	ALI HASSAN
Age: Click or tap here to enter text.	30
Gender: Click or tap here to enter text.	MALE
Organization/Occupation: Click or tap here to enter text.	CHEF./FISHERMAN
Mobile Phone Number: Click or tap here to enter text.	0713576524
Proximity to proposed project site: Click or tap here to enter text.	2km

Cultural Significance

How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?

Always ☑ Regularly ☐ Rarely ☐

Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?

Yes ☑ No ☐

Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?

Yes ☑ No ☐

Socio-economic issues

Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?

Yes ☑ No ☐

Does the Vasco Da Gama Pillar provide heritage education for visitors?

Yes ☑ No ☐

Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?

Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☑ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. At the moment NO.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. NO.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. ATHMAN SEIF
Age: Click or tap here to enter text. 64
Gender: Click or tap here to enter text. M
Organization/Occupation: Click or tap here to enter text. Malindi Marine Association
Mobile Phone Number: Click or tap here to enter text. 0722 613858
Proximity to proposed project site: Click or tap here to enter text. 400 mts
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☐ Moderately Significant ☑ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☐ Moderately Significant ☑ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☑ No ☐
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☑ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. Putting a sea wall is a medium term protection measure as the underlying bed rock continues to weather due to natural weathering and strong waves, ultimately the rock will fall off. It would better to relocate the tower further inland about 50mts from the current position. Any concrete mass devalues the natural aesthetic value/beauty of the coast line and interferes with the flora & fauna along the entire riperian zone. most affected are small crustaceans lizards and insect life. Erecting a wall will interfere with access

Do you have any suggestions on the seawall design aspect that you would like the project to consider?

Click or tap here to enter text.

Instead of building a wall, I propose erection of stone gully stones that are reinforced similar to the old sea wall. The gullies should be placed in the adjacent water to protect from strong sea waves. This will stop the underlying bedrock from sea waves/eventual collapse.

If this is not possible then relocate the pillar further inwards about 50mts on a stable ground. After all the original position of the pillar was at the Old DC's Office. So relocation is still an option if the pillar is to be protected and safety of visitors is to be improved.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. Yunus
Age: Click or tap here to enter text. 42
Gender: Click or tap here to enter text. Male
Organization/Occupation: Click or tap here to enter text. Chairman BMU
Mobile Phone Number: Click or tap here to enter text. 0720172441
Proximity to proposed project site: Click or tap here to enter text.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☑ Regularly ☐ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. Local residents to be considered as employment.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. Wedge shaped wall or standing

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. MONALISA W. NGÁNGA
Age: Click or tap here to enter text. 42 YRS.
Gender: Click or tap here to enter text. FEMALE
Organization/Occupation: Click or tap here to enter text. RESTAURANT OWNER
Mobile Phone Number: Click or tap here to enter text. 0722318170
Proximity to proposed project site: Click or tap here to enter text. 2.5 KMS.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi? IMPORTANT
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑ NOT SURE
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☐ NOT SURE
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed? N/A
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider? NO .
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. MONICA MASIKA
Age: Click or tap here to enter text. 33 YEAR
Gender: Click or tap here to enter text. WOMEN
Organization/Occupation: Click or tap here to enter text.
Mobile Phone Number: Click or tap here to enter text. 0706 167120
Proximity to proposed project site: Click or tap here to enter text.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☑ Regularly ☐ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☐
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?

Click or tap here to enter text.

AS I am I dont know about alot of things in there becuese I do not Live in there, those who Lives in there can explain alot about ~~th~~ that ~~pla~~place. Hope you make it very beatefull for everyone.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. Kithi Kaluma
Age: Click or tap here to enter text. 307
Gender: Click or tap here to enter text. M
Organization/Occupation: Click or tap here to enter text. Fisherman
Mobile Phone Number: Click or tap here to enter text.
Proximity to proposed project site: Click or tap here to enter text. 500m
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☑ Regularly ☐ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. Wall not to extend to the jetty.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. Not be tall to prevent view to the ocean.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: Click or tap here to enter text. Bwana Makka
Age: Click or tap here to enter text. 34
Gender: Click or tap here to enter text. Male
Organization/Occupation: Click or tap here to enter text. Fisherman
Mobile Phone Number: Click or tap here to enter text. 0719699580
Proximity to proposed project site: Click or tap here to enter text. 200m
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☐ Moderately Significant ☑ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☐ No ☑
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. Renovation of specific areas.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. NO

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: FARID ABDALLAH ALI
Age: 56
Gender: MALE
Organization/Occupation: Business Man / Fisherman.
Mobile Phone Number: 0721976030
Proximity to proposed project site: 300m
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☐ Moderately Significant ☑ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☐ No ☑
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☐ No ☑
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☑ No ☐
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☑ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☑ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: Click or tap here to enter text. Muhammed
Age: Click or tap here to enter text. 50
Gender: Click or tap here to enter text. M
Organization/Occupation: Click or tap here to enter text. Fisherman
Mobile Phone Number: Click or tap here to enter text.
Proximity to proposed project site: Click or tap here to enter text. 300m
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☐ Moderately Significant ☑ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☐ No ☑
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☐ No ☑
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☑ No ☐
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☑ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☑ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text.	Lali Athman Lali
Age: Click or tap here to enter text.	44
Gender: Click or tap here to enter text.	M
Organization/Occupation: Click or tap here to enter text.	Fisherman
Mobile Phone Number: Click or tap here to enter text.	N/A
Proximity to proposed project site: Click or tap here to enter text.	200m.

Cultural Significance

How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?

Always ☐ Regularly ☑ Rarely ☐

Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?

Yes ☐ No ☑

Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?

Yes ☐ No ☑

Socio-economic issues

Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?

Yes ☐ No ☑

Does the Vasco Da Gama Pillar provide heritage education for visitors?

Yes ☑ No ☐

Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?

Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☑ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☑ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. Seek local employment.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. Samir Madesen
Age: Click or tap here to enter text. 29
Gender: Click or tap here to enter text. M
Organization/Occupation: Click or tap here to enter text. Fisherman
Mobile Phone Number: Click or tap here to enter text. N/A.
Proximity to proposed project site: Click or tap here to enter text. 200m.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☐ No ☑
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☐ No ☑
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☐ No ☑
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☑ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☑ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. Yuza Mwatimu
Age: Click or tap here to enter text. 26
Gender: Click or tap here to enter text. M
Organization/Occupation: Click or tap here to enter text. Boat Operator
Mobile Phone Number: Click or tap here to enter text.
Proximity to proposed project site: Click or tap here to enter text. 1km
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. Use materials that will last and are strong to avoid constant renovation works.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. Hassan Mohammed
Age: Click or tap here to enter text. Above 40+
Gender: Click or tap here to enter text. Male
Organization/Occupation: Click or tap here to enter text. Boat Operators
Mobile Phone Number: Click or tap here to enter tex NA
Proximity to proposed project site: Click or tap here to enter tex 1km
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. N/A

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. Ali Baba
Age: Click or tap here to enter text. 50+
Gender: Click or tap here to enter text. M
Organization/Occupation: Click or tap here to enter text. Boat Operators
Mobile Phone Number: Click or tap here to enter text. N/A
Proximity to proposed project site: Click or tap here to enter text. 1km
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. Renovation of the pillar itself.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. Pillars to be built with enough

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: Click or tap here to enter text. George
Age: Click or tap here to enter text.
Gender: Click or tap here to enter text. Male
Organization/Occupation: Click or tap here to enter text. Tour Guide
Mobile Phone Number: Click or tap here to enter text. 0704738031
Proximity to proposed project site: Click or tap here to enter text.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. NO

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. No

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text.	Eddy Fundo Kitsao
Age: Click or tap here to enter text.	23
Gender: Click or tap here to enter text.	Male
Organization/Occupation: Click or tap here to enter text.	Tour Guide Malindi Museum
Mobile Phone Number: Click or tap here to enter text.	0702574500
Proximity to proposed project site: Click or tap here to enter text.	

Cultural Significance

How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?

Always ☐ Regularly ☑ Rarely ☐

Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?

Yes ☑ No ☐

Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?

Yes ☑ No ☐

Socio-economic issues

Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?

Yes ☑ No ☐

Does the Vasco Da Gama Pillar provide heritage education for visitors?

Yes ☑ No ☐

Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?

Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. The geographical features at that point which are an attraction not be interfered with.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?

Click or tap here to enter text.

Height of wall
Should be short not to obstruct on view to ocean & sunset and wonderful environment.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. CLIMDMS SAMAMBA.
Age: Click or tap here to enter text. 34yrs.
Gender: Click or tap here to enter text. MALE.
Organization/Occupation: Click or tap here to enter text. BUSINESS.
Mobile Phone Number: Click or tap here to enter text. 0727215216
Proximity to proposed project site: Click or tap here to enter text. 500mtrs.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☐ Moderately Significant ☑ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☐ Moderately Significant ☑ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☐ No ☑
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☐ No ☑
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☐ No ☑
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☐ No ☑

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. —Flow of water

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. JAMES EKEMA
Age: Click or tap here to enter text. 36 years
Gender: Click or tap here to enter text. male
Organization/Occupation: Click or tap here to enter text. Police officer
Mobile Phone Number: Click or tap here to enter text. 0728134373
Proximity to proposed project site: Click or tap here to enter text.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☑ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. No

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. I think it should have gates in both ends, to allow movements in and out as it need to ~~be~~ be as it is now, there is free movement.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. ABubakar Mwinjered
Age: Click or tap here to enter text. 34
Gender: Click or tap here to enter text. M
Organization/Occupation: Click or tap here to enter text. fisherman
Mobile Phone Number: Click or tap here to enter text. N/A.
Proximity to proposed project site: Click or tap here to enter text. 200m
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☐ No ☑
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☐ No ☑
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☐ No ☑
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☑ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☑ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. Shikelly
Age: Click or tap here to enter text. 54
Gender: Click or tap here to enter text. M
Organization/Occupation: Click or tap here to enter text. Fisherman
Mobile Phone Number: Click or tap here to enter text.
Proximity to proposed project site: Click or tap here to enter text. 300m
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☐ Moderately Significant ☑ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☐ No ☑
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☐ No ☑
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☑ No ☐
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☑ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☑ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Boyd Carbin
Age: 51
Gender: M
Organization/Occupation: Captain, Kilifi
Mobile Phone Number: 07
Proximity to proposed project site: 4 km
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☒ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☒ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☒ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☒ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☒ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☒ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☒ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☒ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☒ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☒ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☒
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☒
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☒
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☒
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☒
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☒
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☒
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. Remove Rocks in Water

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Refurbish the lighthouse

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. Jeffer
Age: Click or tap here to enter text. 24
Gender: Click or tap here to enter text. Male.
Organization/Occupation: Click or tap here to enter text. fisherman.
Mobile Phone Number: Click or tap here to enter text. 0704614187
Proximity to proposed project site: Click or tap here to enter text.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☑ Regularly ☐ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. The construction should start as soon as possible. - local residence to be considered for job opportunities during the construction.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. If the the pillar left to collapse it will affect negatively to the fishermen. - The ~~pillar of~~ wall should be constructed in a wedge like shape or in a slanting manner to ~~prev~~ ~~waves~~ to prevent the waves from further destruction of the wall is built in a vertically manner.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: Click or tap here to enter text. Ali Mohamned
Age: Click or tap here to enter text. 50
Gender: Click or tap here to enter text. Male
Organization/Occupation: Click or tap here to enter text. Self employed / Fisherman.
Mobile Phone Number: Click or tap here to enter text.
Proximity to proposed project site: Click or tap here to enter text.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☐ Rarely ☑
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☐ No ☑
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☐ No ☑
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☐ No ☑
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☐ No ☑

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☑ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. Sikubali Poka Kevis
Age: Click or tap here to enter text. 34
Gender: Click or tap here to enter text. Male
Organization/Occupation: Click or tap here to enter text. Fisherman
Mobile Phone Number: Click or tap here to enter text.
Proximity to proposed project site: Click or tap here to enter text. 1km
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☐ Moderately Significant ☑ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☐ Moderately Significant ☑ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☐ No ☑

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. Ukuta urive mrefu. Ukuta ujengwe kwa urembo

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: Click or tap here to enter text. Muhamed Ali
Age: Click or tap here to enter text. 42
Gender: Click or tap here to enter text. M
Organization/Occupation: Click or tap here to enter text. ~~Farmer~~ fisherman
Mobile Phone Number: Click or tap here to enter text. N/A
Proximity to proposed project site: Click or tap here to enter text. 200m.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☐ No ☑
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☐ No ☑
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☐ No ☑
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☑ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☑ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. LUCAS SAFARI YUNGU
Age: Click or tap here to enter text. 27.
Gender: Click or tap here to enter text. MALE
Organization/Occupation: Click or tap here to enter text. FISHER MAN
Mobile Phone Number: Click or tap here to enter text. 0792469569
Proximity to proposed project site: Click or tap here to enter text. 2. M
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☑ Regularly ☐ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. ukuta unaeza Jengwa ila usiwe mrefu kupita kiasi cha kutokuona bahari uiwe kwenye pila kwa manufaa ya wageni na wenyeji kama vile wavuvi wanao nufaika kwa kuvua maeneo hayo.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text. Gerald Kombe
Age: Click or tap here to enter text. 30+
Gender: Click or tap here to enter text. Male
Organization/Occupation: Click or tap here to enter text. Fishermen
Mobile Phone Number: Click or tap here to enter text.
Proximity to proposed project site: Click or tap here to enter text. 500m
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☑ Regularly ☐ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. N/A

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. Wall not to block view of ocean.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text.	REINER HAMANN
Age: Click or tap here to enter text.	67
Gender: Click or tap here to enter text.	male
Organization/Occupation: Click or tap here to enter text.	Pension
Mobile Phone Number: Click or tap here to enter text.	0701-693480
Proximity to proposed project site: Click or tap here to enter text.	4km

Cultural Significance

How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?

Extremely Significant ☒ Moderately Significant ☐ Not Significant ☐

How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?

Extremely Significant ☒ Moderately Significant ☐ Not Significant ☐

In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?

Always ☐ Regularly ☒ Rarely ☐

Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?

Yes ☒ No ☐

Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?

Yes ☒ No ☐

Socio-economic issues

Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?

Yes ☒ No ☐

Does the Vasco Da Gama Pillar provide heritage education for visitors?

Yes ☒ No ☐

Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?

Yes ☒ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☒ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☒
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☒
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☒ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☒
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☒ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. A sea wall is a hard interference and very expensive and hard to maintain

Do you have any suggestions on the seawall design aspect that you would like the project to consider?

Click or tap here to enter text.

May be a less hard intervention like stones or something to break the waves.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text.	ROBERTSON, A
Age: Click or tap here to enter text.	80
Gender: Click or tap here to enter text.	F
Organization/Occupation: Click or tap here to enter text.	RETIRED BIOLOGIST/CONSERVATIONIST
Mobile Phone Number: Click or tap here to enter text.	0721 460 826
Proximity to proposed project site: Click or tap here to enter text.	1 KM

Cultural Significance

How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?

Always ☐ Regularly ☑ Rarely ☐

Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?

Yes ☑ No ☐

Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?

Yes ☑ BUT NOT A WALL No ☐

Socio-economic issues

Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?

Yes ☑ No ☐

Does the Vasco Da Gama Pillar provide heritage education for visitors?

Yes ☑ No ☐

Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?

Yes ☑ No ☐

Will the erection of a ~~seawall to protect~~ PROTECTION FOR the Vasco Da Gama pillar provide employment opportunities?	
Yes ☑	No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?	
Yes ☐	No ☑ PROBABLY INCREASE FISH BREEDING. CHANGES SHOULD BE MONITORED FOR 5 YEARS
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?	
Yes ☐	No ☑ ANY CHANGES TO SHORE PROFILE SHOULD BE MONITORED FOR 5 YEARS
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??	
Yes ☐	No ☑ AS ABOVE
Bio-physical Costs	
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?	
Yes ☑ WHILE BUILDING	No ☑ ONCE COMPLETED BUT MONITORING SHOULD BE DONE FOR 5 YEARS
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?	
Yes ☑ AS ABOVE	No ☑ AS ABOVE
Will the building of the Seawall cause significant negative interference with the shoreline environment?	
Yes ☑ AS ABOVE	No ☑ AS ABOVE
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?	
Yes ☐	No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?	
Yes ☐	No ☑ IF WELL DESIGNED.
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?	
Click or tap here to enter text. ANY CONSTRUCTION AROUND VDG HEADLAND SHOULD HAVE BEEN LINKED TO THE CURRENT (NOW PAUSED) DEVELOPMENTS ON SHELLA BEACH – THE PLAN TO 'BEAUTIFY THE AREA FROM VASCO DA GAMA PILLAR TO JABAK MOUTH'! AS FAR AS I AM AWARE NO EIA WAS DONE BEFORE THE VEGETATION WAS CLEARED & BUILDINGS/CAR PARK/PATHWAYS CONSTRUCTED. THIS 'DEVELOPMENT' MAY HAVE SERIOUS NEGATIVE	

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. - NOT A VERTICAL WALL. - IF EXPENSE NOT AN ISSUE, A 'BREAKWATER' AROUND THE ENTIRE HEADLAND COULD PROVIDE A SECURE WALKWAY FOR LEISURE - BUT IT WOULD HAVE TO BE QUITE HIGH AND VERY STRONG, AND WOULD DETRACT FROM THE VISUAL APPEAL OF 'CORAL CLIFF HEADLAND'. - THE CHEAPEST SOLUTION IS TO MOVE THE PILLAR TO A SAFER LOCATION ! - ANOTHER IDEA WOULD BE TO TRY TO CREATE AN ARTIFICIAL REEF BY DUMPING OLD VEHICLES FILLED WITH STONE. THIS WOULD, HOPEFULLY, BE COLONISED BY LOCAL CORALS, TO FORM A NEW HABITAT FOR FISH ETC.

Thank you very much for your contribution.

- I STRONGLY RECOMMEND MONITORING OF PHYSICAL & BIOLOGICAL EFFECTS OF ANY CONSTRUCTION, FOLLOWING BASELINE DATA COLLECTION. GOOD PROJECTS FOR KEMFRI & GRADUATE STUDENTS AT PWANI UNIVERSITY.

PLEASE DO ALSO INVOLVE DR. DAVID OBURA & CORDIO AT BAMBURI.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

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Name: Click or tap here to enter text.	Edward Karume
Age: Click or tap here to enter text.	46
Gender: Click or tap here to enter text.	Male
Organization/Occupation: Click or tap here to enter text.	Managerial H/A
Mobile Phone Number: Click or tap here to enter text.	
Proximity to proposed project site: Click or tap here to enter text.	Very Near.

Cultural Significance

How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?

Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐

In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?

Always ☑ Regularly ☐ Rarely ☐

Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?

Yes ☑ No ☐

Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?

Yes ☑ No ☐

Socio-economic issues

Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?

Yes ☑ No ☐

Does the Vasco Da Gama Pillar provide heritage education for visitors?

Yes ☑ No ☐

Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?

Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☑ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. Please find out how and why the Adjecent residential properties came to Be.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. That opto Marine Engineers who have to take into Consideration the impact of the wall to the marine and coral impact of the wall. it's necessary to the prevention of the ~~se~~ Piller but their impact to the Marine Life has to be taken into Consideration.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: EDWINE OYWA
Age: 45 YEARS
Gender: MALE
Organization/Occupation: OASIS VILLAGE
Mobile Phone Number:
Proximity to proposed project site: 200 MTS.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
* Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☐
* Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☐
* Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☐
* Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☐
* Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text.

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: Click or tap here to enter text. MAINA NJUGUNA
Age: Click or tap here to enter text. 30yrs +
Gender: Click or tap here to enter text. MALE
Organization/Occupation: WILDLIFE CLUBS OF KENYA
Mobile Phone Number: Click or tap here to enter text. 0722566883
Proximity to proposed project site: Click or tap here to enter text. VERY NEAR
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☐ Regularly ☑ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. Besides the wall, can the old reinforcement beams be redone and if possible added. Also, can some concrete benches be put up facing the ocean.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. At the edge of the wall near the reef, old cars, buses etc can be dropped down into the ocean so as to create some new breeding spaces for fish and produce a new ecosystem altogether

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: Click or tap here to enter text. S Athanasio BE
Age: Click or tap here to enter text. 53
Gender: Click or tap here to enter text. M
Organization/Occupation: Click or tap here to enter text. TRA
Mobile Phone Number: Click or tap here to enter text. 0722846493
Proximity to proposed project site: Click or tap here to enter text.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☑ Regularly ☐ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☑ No ☐
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☑ No ☐
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☑ No ☐
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☑ No ☐
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☑ No ☐
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. It may affect the inter-tidal environment including flora and fauna.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. N/A

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: Click or tap here to enter text. Ali Shidani
Age: Click or tap here to enter text. 50
Gender: Click or tap here to enter text. Male
Organization/Occupation: Click or tap here to enter text. Boat Operators
Mobile Phone Number: Click or tap here to enter text. N/A
Proximity to proposed project site: Click or tap here to enter text. 1km
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☑ Regularly ☐ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. NO

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. no

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL CONSTRUCTION AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: Click or tap here to enter text. Mzee Madonge Ali
Age: Click or tap here to enter text. 40+
Gender: Click or tap here to enter text. Male.
Organization/Occupation: Click or tap here to enter text. Boat Operators.
Mobile Phone Number: Click or tap here to enter text N/A
Proximity to proposed project site: Click or tap here to enter text. 1km.
Cultural Significance
How significant/ important is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
How do you rate the Vasco Da Gama Pillar importance to the tourism sector in Malindi?
Extremely Significant ☑ Moderately Significant ☐ Not Significant ☐
In your observation, how frequently do visitors at Malindi go to see Vasco Da Gama Pillar?
Always ☑ Regularly ☐ Rarely ☐
Have you visited recently and if so do you think that the Vasco Da Gama Pillar is threatened with collapse due to oceanic waves?
Yes ☑ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse using sea wall?
Yes ☑ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☑ No ☐
Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☑ No ☐

Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☑ No ☐
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to the operations of the fishermen/ sport fishing?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent residential properties?
Yes ☐ No ☑
Will the erection of a protection for the Vasco Da Gama pillar cause significant negative interference to adjacent business enterprises??
Yes ☐ No ☑
Bio-physical Costs
Will the building of the Seawall cause significant negative interference with the marine physical environment and associated fauna and flora?
Yes ☐ No ☑
Will the construction of the Seawall cause significant negative interference with the intertidal environment and associated organisms?
Yes ☐ No ☑
Will the building of the Seawall cause significant negative interference with the shoreline environment?
Yes ☐ No ☑
Will the building of the protective Seawall cause significant negative interference with marine mammals such as sea turtles or dugongs?
Yes ☐ No ☑
Will the building of the protection Seawall cause significance negative aesthetic/beauty interference with sea front view?
Yes ☐ No ☑
Do you have any other concerns related to the sea wall construction at Vasco Da Gama that you would like addressed?
Click or tap here to enter text. It shalldn't extend much into the sea.

Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Click or tap here to enter text. N/A

Thank you very much for your contribution.

ENVIRONMENTAL IMPACT ASSESSMENT STUDY FOR PROPOSED SEAWALL AT VASCO DA GAMA PILLAR IN MALINDI

PUBLIC CONSULTATION QUESTIONNAIRE

National Museums of Kenya (NMK) has commissioned an Environmental Social and Heritage Impact Assessment of the proposed project. Environment Impact Assessment is a statutory requirement under legal notice Number 101; The Environmental (Impact Assessment and Audit) Regulations 2003. Public Participation and Consultation is a requirement under the Regulations and projects have to seek the views of persons who may be affected by the project. As a valuable stakeholder, we seek your comments on the activities and operations of the aforementioned project. Kindly provide with the following information/opinion. Thank you.

Name: SHAURI KUETHYA
Age: 39 YEARS
Gender: MALE
Organization: CREEK CONSULTANTS
Mobile Phone Number: 0780116391
Cultural Significance
How significant is the Vasco Da Gama Pillar as a historical and heritage monument?
Extremely Significant ☒ Moderately Significant ☐ Not Significant ☐
Is the Vasco Da Gama Pillar significant in to the tourism sector in Malindi?
Extremely Significant ☐ Moderately Significant ☐ Not Significant ☐
How frequently do visitor to Malindi go to the Vasco Da Gama Pillar?
Always ☒ Regularly ☐ Rarely ☐
Do you think that the Vasco Da Gama Pillar in threatened with collapse?
Yes ☒ No ☐
Do you think that the Vasco Da Gama Pillar should be protected against potential collapse?
Yes ☒ No ☐
Socio-economic issues
Does the Vasco Da Gama Pillar contribute to job creation in the tourism sector?
Yes ☒ No ☐
Does the Vasco Da Gama Pillar provide heritage education for visitors?
Yes ☒ No ☐

Does the Vasco Da Gama Pillar hold cultural and heritage value for Malindi residents?
Yes ☐ No ☒
Will the erection of a seawall to protect the Vasco Da Gama pillar provide employment opportunities?
Yes ☐ No ☒
Will the erection of a protection for the Vasco Da Gama pillar cause significance negative interference to the operations of the fishermen?
Yes ☐ No ☒
Will the erection of a protection for the Vasco Da Gama pillar cause significance negative interference to adjacent residential properties?
Yes ☐ No ☒
Will the erection of a protection for the Vasco Da Gama pillar cause significance negative interference to adjacent business operations??
Yes ☐ No ☒
Bio-physical Costs
Will the building of the protection Seawall cause significance negative interference with the marine life?
Yes ☐ No ☒
Will the building of the protection Seawall cause significance negative interference with the intertidal environment?
Yes ☐ No ☒
Will the building of the protection Seawall cause significance negative interference with the shoreline environment?
Yes ☐ No ☒
Will the building of the protection Seawall cause significance negative interference with marine life?
Yes ☐ No ☒
Will the building of the protection Seawall cause significance negative interference?
Yes ☐ No ☒

Do you have any other concerns related to the projects that you would like addressed?
Click or tap here to enter text.
Do you have any suggestions on the seawall design aspect that you would like the project to consider?
Design in relation to the tide effects, consinder construction materilas that will attract growth of coral on the wall,

Thank you very much for your contribution.

4. Experts Certificates

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/11497

Application Reference No: NEMA/EIA/EL/15516

M/S **Ali Mwachui**
(individual or firm) of address

P.O. Box 85688-80100, Mombasa

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **6805**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **1/8/2020**

Expiry Date: **12/31/2020**

Signature.....

(Seal)
Director General
The National Environment Management Authority

P.T.O.

Conditions For Licensing

1. This license expires on 31st December of the year it is issued.
2. The expert shall comply with code of practice and Professional Ethics for EIA/EA experts.
3. The expert shall comply with the attached conditions.

General Conditions

1. All Environment Experts certified and registered in the accordance with the provision of relevant Regulations, may establish professional associations to complement and implement the objectives of the Code of Practice.
2. An Expert shall act professionally, accurately, fairly and in an unbiased manner in undertaking his work.
3. The Director General, in consultation with relevant stakeholders, may from time to time issue guidelines for the proper conduct of registered Environmental Impact and Audit Experts.
4. Every Environmental Expert shall each year attend at least two relevant seminars organized by the authority for the purposes of improving the professional expertise of its members.
5. No Expert shall exploit the inexperience, lack of understanding, illiteracy or other lack of technical knowledge in environmental matters of a project proponent, owner or the public, for his personal gain.

Receiving Instructions

1. No Environmental Expert shall act for any project proponent unless he has received written instructions form such project proponent or his authorized agent.
2. An Environmental Expert shall not unreasonably delay the carrying out of instructions received from the project proponent of his authorized agent.
3. An Environmental Expert shall discharge his responsibilities to the project proponent with due diligence and integrity.
4. An Environment Expert may terminate a contract on carrying out an environmental impact assessment or audit as stipulated in section 8 of the Code of Practice and Professional Ethics of EIA/EA Experts.

Carrying out an EIA/EA

1. An Environmental Expert shall follow relevant regulations or guidelines and directives issued by the Authority.
2. As Environmental Expert shall take due care and diligence to collect the relevant data to address the significant environmental issues in the various stages of the assessment or audit process and fully acknowledge the source of any data that is not the result of his findings.
3. Environmental Expert shall consult widely with all the relevant agencies, stakeholders, interested parties and the general public on all the matters that likely to affect them.
4. An Environmental Impact Assessment or Audit Report shall be based on the Terms of Reference of the Assignment and shall include all the matters relevant to the findings of the study, all the relevant matters are required by statutory provisions, and must be guided by professional standards and judgments.

Responsibility of Lead Environmental Experts

1. (1) An Environmental Lead Expert shall be responsible for the documents prepared by him/her on behalf of the project proponent.
   (2) An Environmental Expert shall guide the proponent throughout the preparation of the environmental impact assessment and/or environmental audit, and/or during implementation of the Environmental Management Plan.
   (3) An Environmental Expert shall disclose to a client or employer any relationships of conflicting or competing interests that may influence his judgment prior to the carrying out of work.

Misconduct of Environmental Experts

1. An Environmental Expert who contrivances a provision of Code of Practice and Professional Ethics shall be deemed to have committed professional misconduct and shall be subject to disciplinary action by the Authority as appropriate and as stipulated in the Code of Practice and Professional Ethics of Environmental Experts.

Disciplinary Action

1. Where an Environmental Expert is found to have committed professional misconduct by the Environmental Experts' Advisory Committee/Authority shall be punished as stated under section 19 of the code of Practice and Professional Ethics.

Appeals

1. (1) An Expert aggrieved by the decision of the Authority may apply for the review of such decision in the High Court.
   (2) If an application for judicial review shall not have been fined at the expiry of 30 days from the date of the decision of the Authority, the director General may publicize the disciplinary action taken against the Expert.

FORM 7 (r.15(2))

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY(NEMA)

THE ENVIRONMENTAL MANAGEMENT AND CO-ORDINATION ACT

ENVIRONMENTAL IMPACT ASSESSMENT/AUDIT (EIA/EA) PRACTICING LICENSE

License No : NEMA/EIA/ERPL/12198

Application Reference No: NEMA/EIA/EL/16344

M/S **CLAMSON ONDIEKI OGUTU**
(individual or firm) of address

P.O. Box 50532-00200, Nairobi

is licensed to practice in the

capacity of a (Lead Expert/Associate Expert/Firm of Experts) **Lead Expert**
registration number **0524**

in accordance with the provision of the Environmental Management and Coordination Act Cap 387.

Issued Date: **2/25/2020** Expiry Date: **12/31/2020**

Signature…..

(Seal)
Director General
The National Environment Management Authority

P.T.O.