

REPUBLIC OF KENYA



MINISTRY FOR ENVIRONMENT AND MINERAL RESOURCES

INTEGRATED COASTAL ZONE MANAGEMENT

ACTION PLAN FOR KENYA

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CHAPTER 1

1.0 INTRODUCTION

This document presents the Integrated Coastal Zone Management Plan (ICZM-Plan) for the Coastal and Marine Environment of Kenya. It outlines the geographical area covered, its physical and biological attributes, and the population dimension. It then goes on to present the importance of the significance and importance of the Kenya coast on socio-economic terms, before articulating the coastal zone issues and management challenges, facing the area and the need for instituting ICZM as a tool of management for coastal and marine Areas. The early efforts towards adopting the ICZM tool in the country are then traced, culminating in establishment of the legal basis for instituting the tool. The ICZM tool is then described, giving its core attributes in the management of coastal and marine areas. An ICZM Plan and purpose in the management of Kenya's coastal zone is then given, with an outline of the strategy used in its formulation.

Governance of the Kenya coast is then given, but before this is done an outline of the characteristics of the land-water interface is given, followed by detailed information on the available resources and socio-economic opportunities. The governance aspects cover policy, legislative arrangements, and international agreements that catalyze the governance process. The national institutions playing a key role in coastal and marine management are discussed, followed by various environmental management tools that have been used.

The goal, mission, strategic objectives and the thematic areas to be implemented by this ICZM Plan are articulated before the thematic areas are discussed in detail and strategies for addressing the thematic areas given. This is followed by presentation of implementation matrix for the ICZM plan, complete with the actions, outcomes, indicators, actors, time frames and indicative budgets. The document concludes with a presentation of a monitoring and evaluation plan.

1.1 *The Area to be covered by the NPA*

The geographical extent of the coastal zone, which the ICZM Plan of Action is to cover, is defined by the administrative boundaries of districts bordering the Indian Ocean while the Exclusive Economic Zone (EEZ) is the seaward boundary. However, the ecosystem approach will be applied in the management of the resources as some of the pressures affecting the coastal environment are external to the coastal zones such as river catchment areas. Therefore, the area for management focus within the paradigm of ICZM will ideally include all activities that affect the resources and water of the coastal zone, with the ICZM Plan, as a matter of necessity, adapted to this condition.

1.2 The Biophysical Setting of the Coastal Zone

i) Geographical Extent

Kenya has over 600km of coastline bordering the Western Indian Ocean. Its distinct feature is a fringing reef system, running parallel in a south-westerly direction from the Somali border in the north to the Tanzanian border in the South.

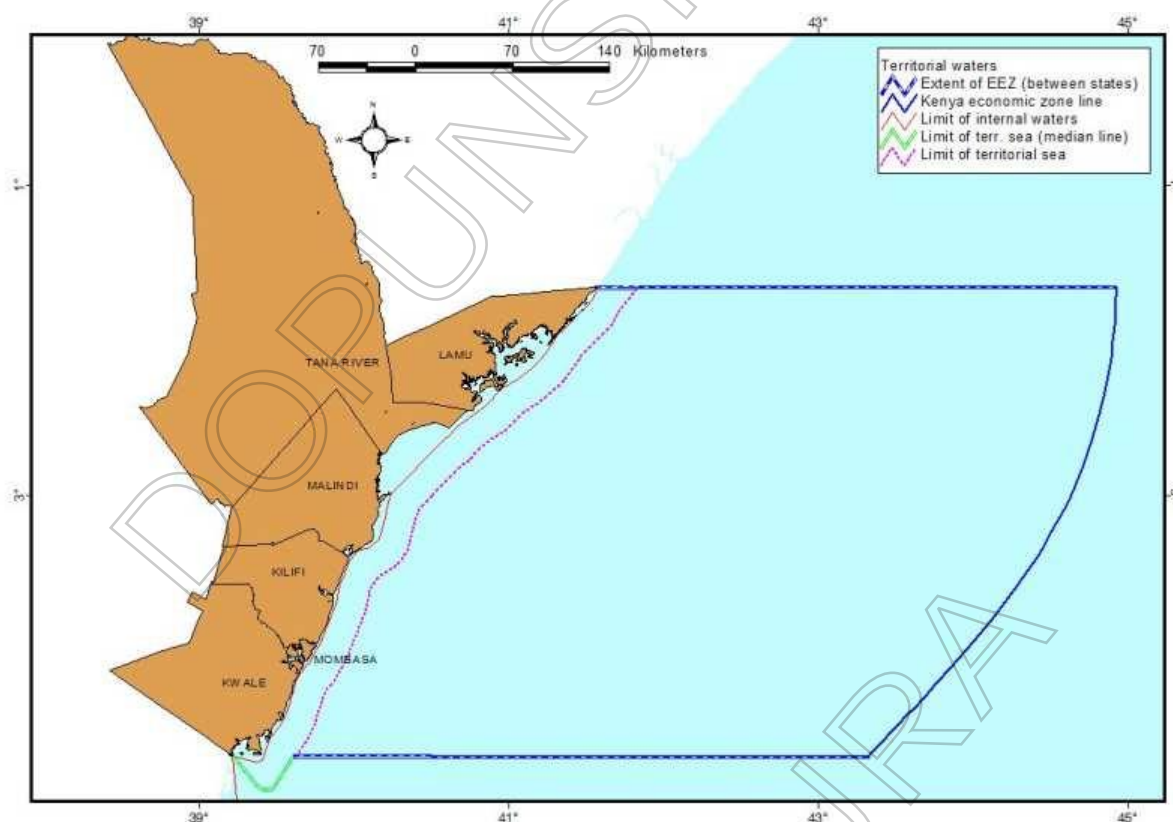


Fig Y: Map of Kenya's Coast Province showing administrative Boundaries and extent of the EEZ

ii) Climate

Climate and weather systems on the Kenya coast are dominated by the large scale pressure systems of the western Indian Ocean and the two distinct monsoon periods. From November/December to early March, the weather is dominated by the Northeast Monsoon, which is comparatively dry. During March and April, the wind blows in an east-to-southerly direction with strong incursions of maritime air from the Indian Ocean, bringing heavy rains. In the months of May to August, the South-easterly Monsoon influence sets in and the weather becomes stable with cooler temperatures. Between September and December, the Northeast Monsoon, dominates again.

The annual rainfall pattern in the Kenya coast is influenced by the Monsoon winds with the main rains coming between late March and early June and decreasing from August. The short rains come in October and November, decreasing rapidly to a

minimum in January and February. During the rain seasons, the coastal strip receives the highest amounts of rain with the amount, decreasing inland. Mean annual rainfall ranges from 510mm in the drier northern hinterland to over 1,016mm in the wetter areas. Relative humidity is high all year round, reaching its peak during the wet months of April to July.

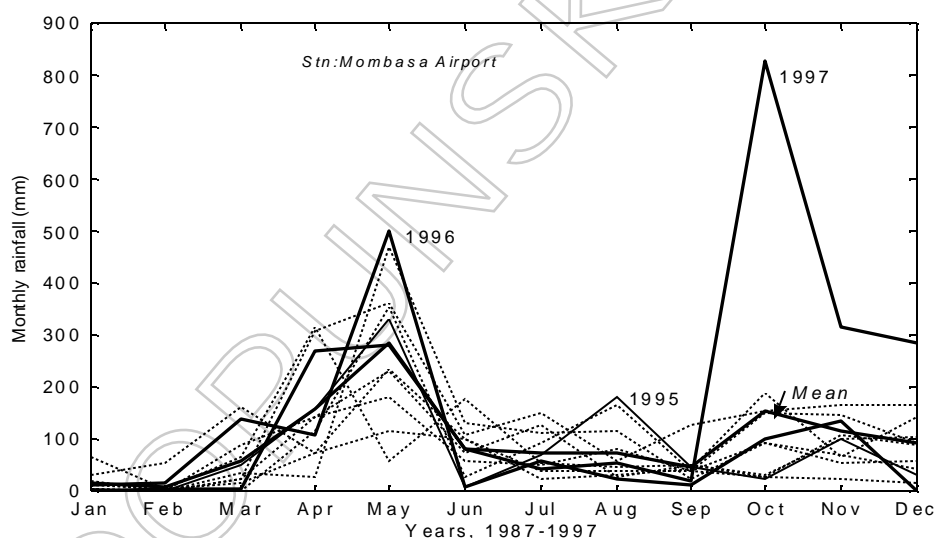


Figure 1: Monthly rainfall averages for all years from 1987-1997 (Source Nguli 2005)

The windiest time of the year at the Kenya coast is during the Southeast Monsoon from May to September. The calmest months are March and November.

iii) Geology and geomorphology

Three physiographic zones are observed on the Kenyan coastal zone. The Nyika lies at 600m above sea level and represents the highest ground covered by the Duruma sandstone series and the older rocks to the west. The foot plateau occurs at an elevation between 140m and 600m above the present sea level. The Coastal Plain is the lowest and rises from sea level to 140m. On average, this belt increases in width from a few kilometres in the southern sector, to over 40km in the north. The geomorphology of the coastal Plain is dominated by a series of raised old sea level terraces.

Soils of the coastal region show considerable variety. The porous parent rocks of sedimentary origin, generally give rise to soils of low fertility. However, patches of highly productive soils occur in areas of alluvial deposits. The principal soil types in the region include a narrow strip of coastal sands towards the north where it is permeated by narrow bands of grumsoils brown clay soils. The soil south of Lamu is composed of bi-alternate bands of loams beyond which the grumsoils are permeated by thick bands of ash and pumice soils.

iv) Hydrology

The perennial rivers, Tana and Sabaki, are the main rivers, draining into the Indian Ocean. Each of these rivers has catchments that extend from the Mount Kenya region and the Aberdare Ranges in Central Kenya. These rivers discharge large amounts of

The map displays the coastal region of Kenya, highlighting the Indian Ocean, Lamu, Malindi, Kilifi, and Mombasa. An inset map shows the location of this region within Kenya, with Lake Victoria, Nairobi, and Mombasa marked. The legend identifies towns (purple dot), rivers/streams (black line), coral reefs (pink line), and mangroves (green area). A scale bar indicates distances of 50, 0, and 50 Kilometers. A north arrow is also present.

There are also a number of semi-perennial and seasonal rivers such as Mwache, Kombeni, Tsalu, Nzovuni, Uмба, Ramisi, Mwachema and Voi, all of which drain into the coastal region from arid and semi-arid catchments. These rivers have moderate loads of silt and their water quality tends to be high. The rivers and coastal lakes are important sources of freshwater for both domestic and industrial uses.

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covered with Jurassic shales and Pleistocene limestone of the low plateau and coastal belt tend to yield relatively poor quality water and yields are normally lower compared with the Kilindini and Magarini sands. Areas with Triassic sandstone geology also have relatively high groundwater yields.

Salt water intrusion to groundwater aquifers is very common in water sources located near the coastline and in areas where there is massive extraction of the groundwater.

v) Oceanography

There are four oceanic currents influencing the Kenya coast. These are the South Equatorial Current, the East African Coastal Current (EACC), the Equatorial Counter Current (ECC) and the Somali Current (SC). The net onshore currents result in the sinking of surface waters along most of the Kenyan coast. The exception is near Kiunga where some mild up-welling is occurs during the Northeast Monsoon.

The meeting of the EACC and the Somali Currents causes upwelling, which is thought to be responsible for high fisheries productivity in Northern Kenya coast.

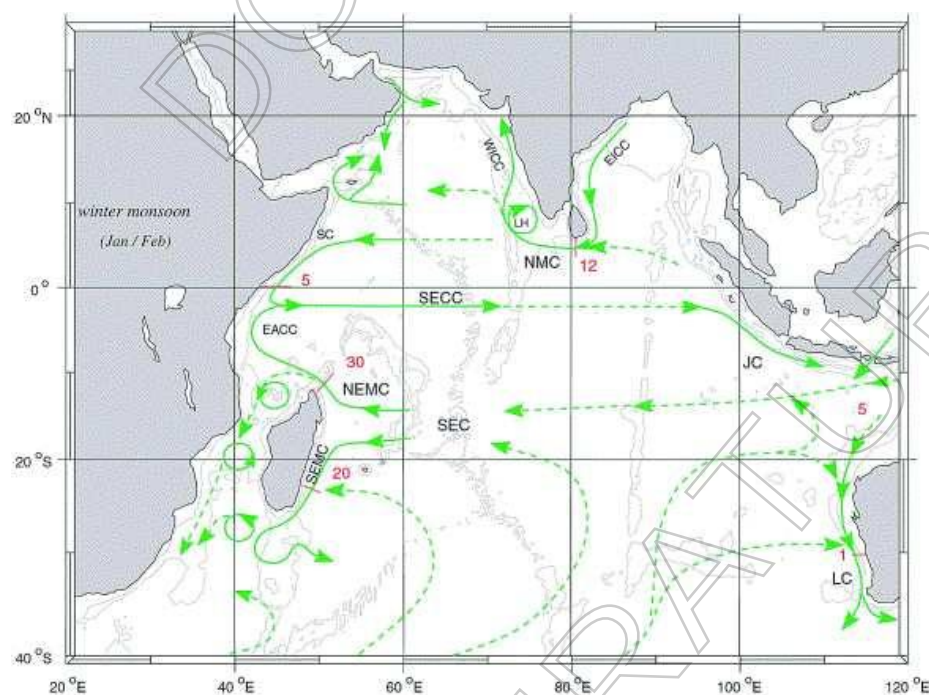


Figure 1 a) Surface currents in Indian Ocean during the North East Monsoon in January and February (Source: Schott and McCreary, (2001)

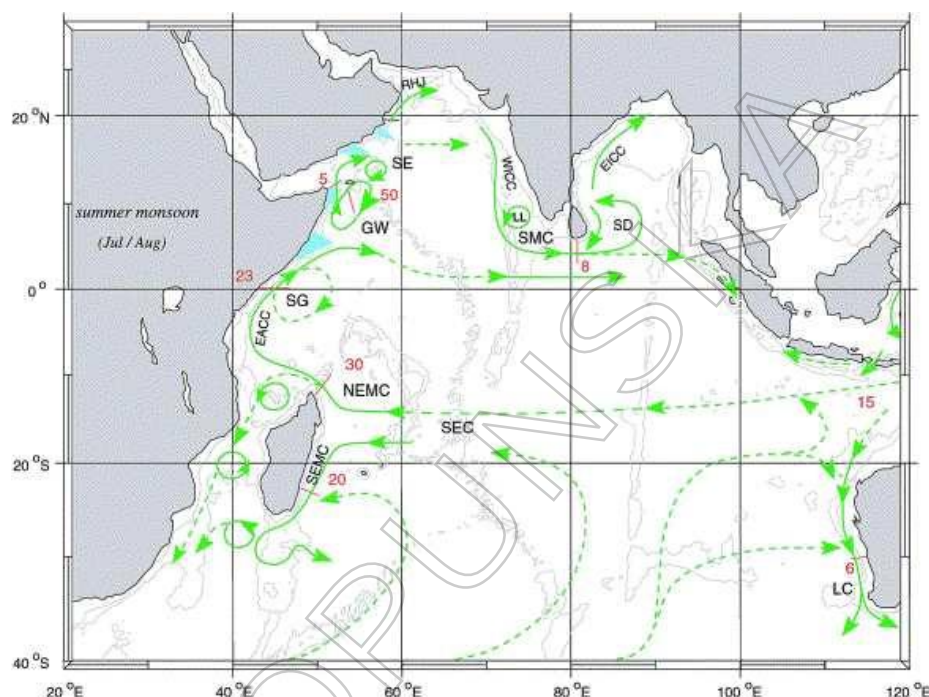


Figure 1 b: Surface currents in Indian Ocean during the South East Monsoon in July and August (Source: Schott and McCreary, (2001))

The Kenya coastal waters are characterised by semi-diurnal tides with approximately two tide cycles every 24 hour period. Except for limited periods in the year, however, the cycles of high and low water of each successive tide differ appreciably from the corresponding tide before and the tide following. The tides can therefore be designated as mixed semi-diurnal tides.

vi) Coastal Ecosystems

Coastal ecosystems in the Kenya coast include coastal forest, mangroves, sea grass beds, and bush land, coastal grasslands, marine beaches and dunes, estuaries and other wetlands. There is also a complex system of bays and some coral islands.

The forests are characterised by dense or moderately dense stands of tall trees and drier woodlands, rich in wildlife. Human settlements have encroached and drastically reduced the size of coastal forests. There are also an estimated 357,200ha of coastal evergreen bush land characterised by woody plants, with an abundance of wildlife except for monkeys, baboons, birds and rodents.

The coastal high bush merges into the hinterland foreland region through transitional vegetation dominated by *Acacia* species followed by Coastal palm stands on open grass lands. These are important areas for birds and monkeys. Many open areas at the coast are dominated by rank growth of grass of about 2-3m high. Then there are the marine beaches and dunes, usually characterised by bare sand dunes, but often, lightly vegetated by highly specialised colonising plants and high woody vegetation cover.

In the Kenya coast are also to be found species that are at risk of extinction. These species include mammals, birds, fishes and plants. Such species need protection, if coastal biodiversity is to be sustained.

As a result of historic sea level rise or subsidence, a large number of estuaries and other wetlands have formed in the Kenya coast. Examples are the Tudor Mtwapa, Mida, Kilifi and Lamu Creeks. These creeks are dominated by mangrove forests and associated plants that generally shelter the coastline from high energy waves. Several human induced changes have, however, occurred in the estuaries.

Seagrass meadows and seaweeds are found in the muddy or sandy areas of the lagoon.

The other dominant feature is the coral reef system, which occurs as coral flats, lagoons, reef platforms and as fringing reefs.

vii) Demography

According to the 1999 Population and Housing Census, there were 28,686,600 people in Kenya. Of these, 2,487,300 people resided in the Coast Province (see Table 3). The national population projection for 2005 was 33,445,100; while it was 2,927,300 for Coast Province. Thus, the coast province supports about 10.2 % of the national population, a population which is growing at the rate of 3.1 % p.a. which is faster than the national average of 2.9 % p.a. (GOK – 1999 Census). The population in the Province increased from 1.83 Million in 1989 and to 2.5 Million in 1999. This represents a 37 % increase between 1989 and 1999.

Around 30% of the coastal population lives in urban areas while the remaining 70% resides in rural areas.. Mombasa District has 86% of its residents, living in its urban area. Important urban areas include Mombasa, Kwale Town, Diani, Mtwapa, Kilifi Town, Malindi Municipality, Watamu, Garsen and Lamu are important urban areas.

Table X: Population Data for the Seven Coastal Districts, 2002

Parameter	Mombasa	Malindi	Lamu	Kwale	Kilifi	Taita-Taveta	Tana-River	Total
Population size	741,086	305,143	72,686	536,114	597,354	259,889	200,326	2,712,598
Population growth rate	3.60%	3.90%	-	-	3.05%	1.70%	3.40%	-
Population density (persons per sq km)	2,896	36	332	65	125	40	5.5	3,499.50
Urban population	585,543	136,826	17,130	78,035	189,227	96,658	17,086	1,120,505

Source GOK, 2002: Coast province Profile (unpublished data); - missing value

1.1 Significance of the Kenya Coast

It is recognized that the Kenya coast has some of the world's most valuable coastal and marine ecosystems that contribute to the livelihoods of the people. These resources are of high importance to coastal communities and the country as a whole.

The natural resources based economic activities in the Kenya coast include tourism, port and shipping activities, agricultural industry, fisheries, agriculture, forestry and mining. Opportunities of employment from the above sectors, is the reason why, the Kenya coast, has attracted a large population to the area.

While the Kenya coast has important ecosystems that support livelihood, they are fragile and vulnerable to changes in the quality of the environment and the large and expanding population at the coast has caused numerous problems. Such problems include overcrowding of the population in urban areas, decline in water quality due to poor sanitation and inadequate waste management practises with effects manifesting themselves from water borne diseases, deforestation and erosion of the coastline, over-exploitation of the resources, resulting in changes in ecology, construction in ecologically sensitive areas and excessive demand on infrastructure and services, ultimately leading to resource use conflicts.

Recognizing this problem, Kenya like other West Indian Ocean (WIO) states has realized the urgent need for better and more effective management of the coastal zone seeking to improve the quality of life of its people, sustaining its economy and maintaining the integrity and biological diversity of the coastal and marine ecosystems.

1.2 *The Coastal Zone Issues and Management Challenges*

The coastal zone issues and management challenges include: -

- i) Poorly planned and uncoordinated coastal development as a result of a sectoral approach in planning and management.
- ii) Inadequate partnership and cooperation between government and non-government stakeholders at local, national and regional level, towards development and management of the coastal zone.
- iii) Weak institutional and legal frameworks that do not adequately address the complex multi-sectoral problems facing coastal areas.
- iv) Lack of effective strategies for community empowerment and to address unsustainable livelihoods.
- v) Poor waste management practices, especially in urban centres, posing a public health risk.
- vi) Declining water quality and inadequate sources of potable water is a serious constraint to the socio-economic development of the coastal area.
- vii) Shoreline change, manifested in beach erosion and accretion, posing a threat to coastal developments.
- viii) Destruction and loss of coastal and marine habitats as a result of unsustainable exploitation, poor land use practices, encroachment and unplanned and unregulated human settlement and urban development.

- ix) Inadequate communication, education and awareness on coastal zone management issues.
- x) Uncoordinated research and monitoring programmes that do not adequately inform the management of coastal zone resources on issues affecting them.
- xi) Lack of, or, inadequate mechanisms to address emerging issues affecting the coastal zone, such as climate change, droughts, floods and Tsunami, storm surges among others incidents.
- xii) Lack of/inadequate mechanisms to preserve national cultural and natural heritage and manage tourist activities at heritage sites.

A main challenge in managing coastal resources and its environment is the existence of multiple jurisdictions with a stake in the area. This makes coastal zone management a secondary responsibility of most jurisdictions, but a primary responsibility of none. In the present arrangement where management is sectoral, the management focus objective is only on economic and development goals, which ignore the interconnections within coastal ecosystems to the detriment of sustainability. There is thus a need to adopt the ICZM approach in management of the coastal zone and its associated resources.

1.3 *The ICZM Process in Kenya*

The Kenya coast supports activities that, apart from their importance for the overall economy of the country, also support the livelihood of the great majority of the coastal population. Importantly, the economic activities including tourism are nature based. Over time, increasing pressure on the resources, started to disturb important coastal habitats, undermining the base upon which the various livelihoods depended on, and the need to arrest the situation was realised, with efforts started towards that direction.

Early efforts to evolve the ICZM process in Kenya were made by the National Environment Secretariat (NES), working within the Regional Seas Programme of the United Nations Environment Program UNEP in 1984. The project eventually involved other government agencies including the provincial administration, but actual efforts had to wait until 1993 to benefit from UNEP's 1992 EAF/5 Project on the "Protection, Development and Management of the Coastal and Marine Environment of Eastern Africa".

The Arusha Resolutions of 1993 laid the basis for recognising the strong interdependence of ecology and economics of the coastal region. Upon signature of the Resolutions, countries of the Eastern Africa Region committed themselves to establish policies that promote and enhance integrated planning and management of coastal areas. The Arusha Resolutions also recognised the importance of the Nairobi Convention on the Protection, Management and Development of the Coastal and Marine environment of the Eastern African Region.

Pilot efforts in documentation for "Action Strategy" to manage the resources of the Nyali-Bamburi-Shanzu area sustainably in 1996 by a multi-institutional team under

the coordination of CDA represent a demonstration of an Integrated Coastal Zone Management process in Kenya.

In 1999 the Environmental Management and Coordination Act (EMCA 1999) in its Sec. 55 (2) empowered NEMA, in consultation with the relevant lead agencies, to prepare a survey of the coastal zone and prepare an integrated national coastal zone management plan based on the report of such a survey. A national ICZM Steering Committee was established in 2005 with NEMA as Secretariat providing a coordination platform including main stakeholders from the coast and national levels.

Efforts coordinated by NEMA through the ICZM Steering Committee has since led to the productions of the first State of the Coast Report which was launched at the Conference of Parties to the Nairobi Convention at its meeting in Kenya in April 2010 and to the drafting of an ICZM Policy which was validated in March 2010.

Subsequently, the Government through NEMA went further to form a multi-sectoral ICZM Steering Committee to spearhead the development of the ICZM policy. This Committee helped in identifying the coastal zone management issues and facilitated the formation of thematic groups and with the help of experts generated the necessary information on the issues. The information was then presented in a National Stakeholders Workshop for validation where other issues were identified for inclusion. It is through this process that the Draft ICZM policy for Kenya was produced. This ICZM- Plan therefore constitutes the blue print of the actions that implement the ICZM tool for the management of Kenya's Coastal Zone.

1.4 *Why Integrated Coastal Zone Management*

Thia-Eng, 1993 stated that ICZM involves the comprehensive assessment, setting of objectives, planning and management of coastal systems and resources, taking into account traditional, cultural and historical perspectives and conflicting interests and uses, all within the limits set by natural dynamics. It is a continuous and evolutionary process for achieving sustainable development in the coastal and marine environment and covers the full cycle of information collection, planning decision-making, management and monitoring of implementation. It is a process by which interventions (policy, laws, regulations, programs, plans) are devised and implemented to change the way people use and interact with coastal ecosystems and their resources in order to attain the highest possible flow of benefits over time without preventing future generations from enjoying similar benefits.

Chua-Eng, 1993 further stated that ICZM uses the informed participation and cooperation of all stakeholders to assess the societal goals in a give coastal area, and to take action towards meeting these objectives. "Integrated" in ICZM refers not only to the integration of objectives, but also the integration of all relevant policy areas, sectors and levels of administration. It also means integration of the terrestrial and marine components of the target territory, in both time and space with the main objective of maximizing net social benefits society can obtain from coastal and marine resources and ecosystems for eternity subject to sustainable development, equitable distribution of benefits, rational use of the resources and factors of production, and optimizing resource rents.

ICZM is important because it helps those managing the coastal and marine environment and its resources obtain answers to questions like: -

- i) "What is the best way to manage coastal and marine areas and their resources, while maintaining the resilience of their systems?"; and
- ii) "How can coastal and marine areas and resources be best developed to provide desired products and services to meet human needs, while maintaining viable diverse ecosystems?"

1.6 Purpose of the ICZM-PLAN

The purpose of the ICZM-Plan is to detail the coordinated actions required for addressing the major concerns for the sustainable management of the development of the Kenya coast as identified in the State of the Coast Report and guided by the draft ICZM Policy.

1.7 The Strategy used in Formulating the ICZM-PLAN

In 1995, the CDA established the ICZM Steering Committee to serve as a coordination platform for ICZM in Kenya. This Steering Committee was chaired by the Kenya Marine and Fisheries Research Institute. Through this Committee, a comprehensive analysis of the situation at the coast was undertaken to identify issues, concerns and opportunities for integrated coastal zone management.

Consequently, NEMA institutionalised the process, and working with a Team of Experts, published and launched for wider distribution the first State of the Coast Report for Kenya in April 2010. This Report was used by the institutionalised ICZM Steering Committee to develop a policy framework for addressing the issues, concerns and opportunities identified in the situational analysis, with the draft ICZM Policy, presented for and validated in March 2010.

Again, through the ICZM Steering Committee, and guided by the draft ICZM Policy, the formulation of detailed coordinated actions to address the issues, concerns and opportunities identified in the situational analysis for the sustainable management of the Kenya coast, commenced. The formulation has been assisted by a team of experts and a national consultant and the resultant ICZM National Plan of Action for managing Kenya's coastal and marine environment was validated for institutionalization by the Government in a national stakeholder workshop in June 2010.

CHAPTER 2

2.0 COASTAL MARINE ENVIRONMENT AND ITS GOVERNANCE

This chapter presents an overview on the characteristics of Kenya's coastal marine environment; the socio-economic opportunities that are derived from these resources; the policy, legislative and institutional frameworks guiding the governance of the resources, including the relevant international agreements that give impetus to coastal and marine zone management. The chapter also highlights the various tools supporting coastal and marine environment management.

2.1 *Resources & Socio-Economic Opportunities*

2.2.1 *Uniqueness of the Land-Water Interface*

The land and sea parts of the coastal zone are connected by intensive flows of matter such as water run-off, aerial transfer of water vapour and salts, and ingress of sea-water. This section covers both the terrestrial and the marine environment providing information on the landscapes, the structure of the land use and the ecological situation for the former, and information on the water environment for the latter covering issues that include on-water activities and the pollution problems, among others.

In coastal areas as a whole various branches of the economy have combined to utilize natural systems, human resources, constructed resources, cultural heritage and archaeological resources in the production of goods and services. Examples of which are extraction of biotic resources, freshwater, salt, energy, wood, agricultural products, oil, gas, minerals and sand; the services encompass recreation, ecosystem functions, disposal of waste, and transport.

The interaction between people and their economic activities on one side and natural systems on the other is the main cause of degradation of the coastal environment and its resources arising from over-exploitation of coastal resources and increased social pressure over coastal ecosystems, leading to reduced capacity of coastal ecosystems to satisfy human needs, and causing resource use conflicts, and loss of potential benefits due to externalities.

2.2.2 *Coastal Resources*

Coastal and marine resources are the backbone of Kenya's coastal economy, providing ecosystem functions and socio-economic development options through their exploitation in tourism, fisheries, salt manufacturing, shipping, agriculture and construction among other activities.

i) Land Resources

Apart from the use of land for human settlements and other socio-economic activities including tourism and conservation, the land, despite its low potential, has been used extensively for agricultural production. Important agricultural crops are horticultural

products, especially vegetables and tropical fruits. Other includes sisal, cotton, cashewnuts and bixa. Maize and cassava are also grown as food crops.

ii) Minerals

There are several mineral resources being exploited along the Kenya Coast. These include salt gypsum, iron ore, lead, barite, lime, lime stone, clay and apatite. A major discovery of titanium deposits, described as one of the largest and highest grade undeveloped resources of rutile and zircon in the world is yet to be developed.

Mineral extraction is a source of income and livelihood for a significant number of people. However, despite this contribution to the local economy, mineral extraction is associated with many impacts on communities and on the environment. Salt mining in Gongoni area in Malindi is associated with salt water intrusion of fresh water aquifers; it is also responsible for destruction of mangrove forest. Fossil coral mining is associated with the creation of badlands, desiccating the landscape. Clay mining for pottery, in addition to creating badlands, is also associated with over-harvesting of mangrove forests.

Extraction and utilization of the mineral resources therefore call for prudent and coordinated measures to streamline activities with a view to making mining a sustainable industry that supports economic development for enhanced livelihoods while safeguarding the environment.

iii) Wildlife Resources

The Kenya coast has considerable area for wildlife in the Marine and Terrestrial Parks and Reserves. In the Terrestrial National Parks and Reserves are to be found, the "Big Five" of Africa including the lion, leopard, buffalo, rhinoceros, and the elephant; in Marine Parks are dolphins, sharks, dugongs and an array of fish. Other significant population of wildlife is found in reptiles and birds.



African Fish Eagle in Tana Delta (Source: Michael Toulouse). The delta harbours key breeding sites for the bird

Wildlife resources have attracted tourism trade, supporting the country's economy in addition to providing livelihood to local communities. Examples where wildlife is utilised sustainably include Arabuko Sokoke, where butterfly farming for export, is thriving; the Haller Park Nature Trail and Mamba Village in Mombasa, where giants crocodiles are being reared for direct consumption and tourism.

iv) Coastal Forests

The coastal forests exist as isolated blocks covering a total area of about 83,800 hectares in a narrow belt which extends inland for about 30 km. The largest of these forest patches is the Arabuko Sokoke forest reserve. Other forest patches include the Boni-Lungi, Dakacha, Dodori, the Shimba Hills Forest reserve and the Kaya forests.

These coastal forests host unique communities of flora with high drought resilience, high levels of adaptation, endemism of birds, mammals and other fauna. They play a significant role in the hydrological cycle, enhance soil moisture content, mitigate against soil erosion and promote the flow of clear water in rivers. Coastal forests are important carbon sinks, reducing green house gases that cause global warming, while Kaya forests, in addition, are of spiritual and cultural importance to the Mijikenda community. Coastal forests have been exploited for timber, wood-fuel and herbal medicines.



Charcoal burning and illegal logging are some of the threats facing coastal forests

Threats to coastal forests come from requirement of more land for expanding human settlements, over-exploitation, charcoal burning, clearing of land for agriculture and other socio-economic activities.

v) Mangrove forests

There are between 53,000 - 61,000 hectares of mangrove forests along the coast. The mangrove ecosystem is a critical habitat for a variety of fish species and invertebrates, which depend on it for feeding and nursery grounds. The habitat also hosts a wide variety of bird life, and provides a line of defence against shoreline erosion and excessive suspended sediment from terrestrial sources. The artisanal fishers rely on the mangrove ecosystem for a substantial part of their catch, while other non-consumptive uses of mangrove forests include aesthetic use of forest bio-diversity in eco-tourism, and for bee keeping. Extractive uses of mangrove forests include exploitation for timber, wood-fuel and herbal medicines.

Mangrove forests have important ecosystem functions such as acting as carbon sinks, reducing green house gases that cause global warming; and spiritual and cultural functions, as shrines for some local communities.



Threats to mangrove forests come from the spread of human settlements, the economic activities of tourism, which compete for land space, over-exploitation, deforestation, clearing of land for agriculture and from siltation, arising from upstream poor farming activities, among other activities. In recent years, mangrove forests have been cleared to make way for agriculture, fish ponds, prawn farms, salt pans, residential houses, industries and dump sites.

vi) Coral reefs

Coral reefs exist along most of the Kenya coast. They occur as coral flats, lagoons, reef flats and as fringing reefs. The total area of coral reefs in Kenyan waters is estimated to be around 50,000 ha and the coral types include the families *Portidae* and *Faviidae*. The reef system is broken at places where river mouths, creeks and bays open into the ocean.

The best known reefs are in the Watamu-Malindi area, most of which are included in within the boundaries of two Marine National Reserves and Parks. Marine fauna in coral reefs include molluscs, turtles, parrot fish and the crown-of-thorns star fish, which are specialised to feed on coral polyps. Other fish groups associated with coral include moray eels, damselfishes, acathurida, cardinal fish, wrasses, angelfish, scorpion fish, etc. Other fauna include the long spined sea-urchin, the giant sea anemone, and lobsters.



Exposed fringing reef along Kilifi coastline. The waves are breaking at the reef crest. Doesn't Fit here

Coral reefs are among the world's valuable ecosystems in terms of biological diversity and productivity and as a source of livelihood for many coastal communities. Apart from providing natural defence of the shoreline from wave-erosion, and being the source of sand that replenishes local beaches, important for tourism, reefs and associated lagoons support fisheries. Kenya's coral reefs are important for fisheries, with the tourism industry providing the main market for fish products supporting the local economies of Lamu and Malindi as important fish landing ports. Tourism however also poses a threat to the reefs with large quantities of shells and corals, known to have been collected for trade. Many species are probably being over-exploited and careless collection methods have led to serious habitat damage. Despite controls, large quantities of coral and shells are still exported from Kenya.

These pressures, coupled with silt deposition from rivers draining agricultural land, pollution, mining, oil discharge from tanker traffic and the effects of climate change that are causing global warming, leading to coral bleaching, have diminished both the productivity and species richness and diversity of the entire coast. Recovery of degraded reefs is slow and could take up to 50 years to take place.

vii) Sea-grass beds

Seagrass beds are found predominantly in the sandy and muddy area of the coastal lagoons. Twelve species of seagrass have been recorded from Kenyan waters, but studies on their distribution, densities and productivity is very scanty.



A seagrass bed in Kanamai, Kilifi (Source: NEMA database). These habitats serve as important foraging grounds for dugongs and sea turtles.

Seagrass provide a habitat for a variety of commercially important fish species, supporting mature fish whose early life stages are found in estuaries and mud-flats. Sea-grass areas provide important feeding grounds for threatened and/or endangered species such as the green turtle, the hawksbill turtle and the dugong. Sea-grass beds are trawlable, using larger mesh sizes and in this way various species of rays, octopus, holothurians, etc, can be fished.

The major threat to seagrass meadows comes from excessive sedimentation of shallow coastal waters resulting from erosion of agricultural lands. Turbidity from a number of causes also tends to cut down the light penetration and seagrasses cannot thrive under such conditions.

viii) River basins, deltas and estuaries

The Tana and Athi-Galana-Sabaki Rivers are the largest river basins in Kenya. These together with the relatively smaller basins drained by the R. Uмба, R. Ramisi and R. Mwache, discharge a combined average of 10 million cu metres of freshwater and between 10-20 million tonnes of sediment annually into the Indian Ocean.

Threats to River basins emanate from erosion, caused by poor land use practises upstream, nutrient loading from fertiliser use in agriculture, pollution, etc, all of which impact coastal habitats and the aesthetic value of beaches, adversely affecting coastal ecosystems, and hurting the tourism industry.

Estuaries have their shores fringed by mangrove trees and associated plants and have the same importance as the coastal and mangrove forests, supporting livelihoods, as habitat for fish, supporting fisheries development. However, silt deposition from rivers, and the clearing of riparian land expose the soft shores of estuaries to erosion and accretion in some areas (as seen north of Malindi town), leading to impact of natural systems.



Tana River delta and Sabaki Estuary. Note the high suspended sediment discharging from the two rivers at the time of the aerial survey.

The Tana delta is the only major ocean delta in Kenya. It is low lying and characterised by diverse habitats including riverine forests, grasslands, woodlands and bush land, lakes, mangroves, sand dunes and coastal waters. During the rainy season, it is subjected to flooding, resulting changes in the network of channels and canals. This maintains high levels of productivity in a dynamic balance, revolving around the frequency, extent and duration of the flooding. This influences a wide variety of habitat types. It helps in flushing wastes, controls salinity, and disperses and nurtures larval stages of a number of coastal organisms.

The ecological and socio-economic importance of deltas cannot be questioned, and the threats to the delta environment, stemming from anthropogenic activities should not be underestimated.

ix) Beaches and sand dunes

Sand beaches are common along the Kenyan coastline, with river discharge being the source of terrigenous sediment that supplements the replenishment of sand to beaches and dunes. There are an estimated 27,000 ha of beach and sand dunes in Kenya with prominent wind-blown dunes stretching from Malindi to Lamu, enriched with the high loads of suspended sediment from R. Sabaki and Tana, forming the beach sand, while dunes are effectively stabilized by associated vegetation by binding loose sand with their root system.



Sand dunes in Lamu Island. The sand dunes serve as important water catchment for Lamu town and surrounding areas of the island

Beaches provide nesting grounds for sea turtles, and offer important habitat for shore and migratory birds. They are important for providing access to the sea for fishing, recreation and tourism. Sand dunes assist in the retention of freshwater tables, protecting against saltwater intrusion. The supply of drinking water to Lamu town, Ngomeni and Mambrui is sourced from adjacent dune areas.

Threats to beaches and dunes emanate mainly from the extraction of sand which is used for construction.

x) Natural and cultural heritage

National and world heritage areas attract tourism, supporting regional economic development and both domestic and international contributes towards the conservation of cultural heritage in Kenya. The relation between the local community and tourists has been rather harmonious, which may be because the local community is actively involved in tourism development and derives benefits from the industry. However, issues of cultural pollution and marketing Kenya as a mass tourism destination have failed to enhance real benefits to the community. There is a need for better visitor management to minimize negative cultural impacts on local communities.



Vasco da Gama Pillar in Malindi & Giriama grave markers and ancestral figures, 'Vigango' that are typical features of the Kaya sites.

In recent years this heritage has been under increasing pressure from population growth, deforestation, farming and uncontrolled tourism. Seven Kaya sites have been listed as UNESCO Heritage Sites, a safeguarding measure for the protection of this natural and cultural heritage.

xi) Species at Risk

The Kenya coast hosts mammals, birds, fishes and plants that are endemic to Kenya. The Kenya coast also appears to be the habitat for the majority of Kenya's internationally threatened species. Of the 159 species of trees and shrubs that are considered threatened, 60 of them come from the Coast; of the 71 species of threatened birds, 19 inhabit the Coast; while out of the 9 threatened mammal species, 5 are in the Coast environment.

Table ??: Coastal and marine threatened species and/or flagships species in Kenya (Source: GOK State of coast Report, 2009)

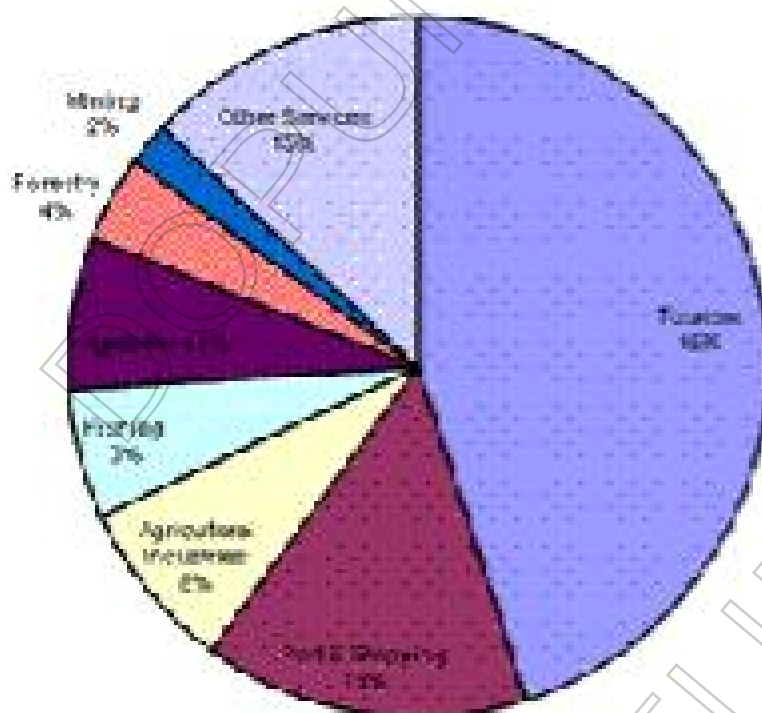
Genus/Species (local name)	Scientific Name	Conservation status	Where found
Sharks	<i>Carcharhinidae</i>	None	Juveniles borne in shallow, mangrove areas; adults in offshore reefs and deep oceanic waters
Whale shark	<i>Rhinocodon typus</i>	None	Entire coastline beyond the reef slope
Humphead wrasse	<i>Cheilinus undulatus</i>	None	Off-shore reef areas
Ceolocanth			Deep waters – below 1000m
Seahorses	<i>Hippocampus kuda</i>	None	Inner shore seagrass areas
Coconut crabs	<i>Birgus latro</i>	None	Mpunguti Island
Spiny lobsters	<i>Palinuridae</i>	None	Inner shore and off shore reefs
Groupers	<i>Serranidae</i>	None	Inner shore and off shore reefs

Triton Shell	<i>Charonia tritonis</i>	None	Reef flats and sandy areas
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Threats to the species come from their habitat loss, occasioned by the physical destruction and alteration of their habitats through many socio-economic activities.

2.2.2 Socio-Economic Opportunities

Key sectors in the coastal economy include tourism, fisheries, agriculture, forestry and trade. The contribution of tourism to the national economy is about 12% of the GDP of which about 60% comes from coastal tourism.



Figure??: Principal economic activities and their contribution to livelihood and income of the coastal people (Source: GOK State of Coast Report, 2009)

Fisheries contribution to the national economy stands at 5% of the GDP, of which about 5.6% comes from marine fisheries. While the contribution of tourism to the coastal economy accounts for 45%, the port and shipping contributes 15%, agricultural industry contributes 8%; agriculture contributes 5% and forestry accounts for 4%. This is a significant contribution to Kenya's Gross Domestic Product. Over time however, these resources have been under pressure from a rising population and rapid development.

2.2 Review of the Policy Framework

2.2.1 Introduction

In this section, a review of the policy instruments that are relevant to the management of the coastal and marine environment is undertaken. The objective of which is to single out those that add synergy, or, need realignment, for successful implementation of the NPA

2.2.2 The Draft Environmental Policy, 2009

The aim of the draft National Environment Policy (2009) is to provide a framework for sound environmental and natural resource governance by mainstreaming environmental considerations into sectoral policies and strengthening regional and international cooperation in environmental management.

Key objectives of the policy include

- (a) Provide a framework for integration of environmental considerations into the various sectoral policies, national development planning and decision making processes.
- (b) Ensure sustainable management of the environment and natural resources, such as unique terrestrial and aquatic ecosystems, for national economic growth and improved people's livelihood and well-being.
- (c) Promote and enhance collaboration, synergy, partnerships and participation in the protection and conservation of the environment by all stakeholders.

The key issues addressed by the policy include the harmonization of sectoral policy instruments with the framework environmental law (EMCA) 1999 in order to enhance sustainable environmental management.

2.2.3 The Draft Integrated Ocean Policy, 2009

The draft integrated ocean policy, derived from the provisions of the 1982 Law of the Sea Convention (UNCLOS), Maritime Zones Act 1989, Section 5(5) and the Presidential Proclamation of 9 June 2005, gives Kenya sovereign rights with respect to exploration, exploitation, conservation and management of the natural resources. The policy focuses on resource management in internal waters, territorial waters, and the EEZ. Its effective implementation will require synchronising it with the draft ICZM policy to minimize duplication of effort, resolve conflict, and foster synergy.

2.2.4 The National Oceans and Fisheries policy, 2008

The overall objective of the National Oceans and Fisheries policy is "to enhance the fisheries sector's contribution to wealth creation, increased employment for youth and women, food security, and revenue generation through effective private, public and community partnerships". It recognises the inter-jurisdictional aspects of marine fisheries, calling for collaboration and cooperation in the management of

migratory/shared stocks. These issues are typical coastal and marine zone management issues and integration of the oceans and fisheries policy with the draft ICZM policy will add synergy in coastal resource management.

2.2.5 The Water Policy, 1999

The Water Policy deals with the problems of water supply and sanitation following an integrated approach to water resources management. This approach recognises the inextricable link between the provisions of water supply, and wastewater discharge. Applying various tools for effective management, the use of effluent discharge standards and permits for water abstraction and disposal have provided economic instruments for water pollution control, encouraging participation of communities and private institutions as service providers with the government undertaking the role of a regulator.

2.2.6 Draft Wetland Policy, 2009

The draft Wetland Policy (2009) recognizes the importance of the variety of wetlands found in the coastal, marine and inland areas, in the provision of goods and services which support social economic and cultural activities. The Policy seeks to foster an integrated approach that would promote conservation and sustainable use of wetlands.

The wetlands policy complements the other sectoral policies on environment and development. Adoption of the policy fulfills Kenya's obligations under the Ramsar Convention and other relevant Multilateral Environmental Agreements and Protocols. The objectives of the Wetland policy address issues that are very pertinent with the development, management and sustainable exploitation of the coastal zone and its resources.

2.2.7 The Draft National Land Policy, 2009

The specific objectives are to develop a framework of policies and laws designed to ensure the maintenance of a system of land administration and management that will provide all citizens with the opportunity to access and beneficially occupy and use land; use it economically, equitable and environmentally sustainable, taking into concern issues of efficiency, effective and economical operation of the land market.

To achieve this the draft National Land Policy requires that all policies, regulations and laws dealing with land based resources be harmonised with the framework established by the Environmental Management and Coordination Act, 1999. Recognising the coastal zone as fragile, the draft National Land Policy has set guidelines for formulating land use and management practises. Since the sector is a major source of deleterious effects on the coastal and marine environment, urgent reforms to re-engineer the organization of the sector into socially-relevant, hence accessible to the vast majority of the land users, would contribute immensely in attainment of ICZM Plan objectives.

2.2.8 The Draft Forestry Policy, 2009

The draft Forest Policy envisages a radical change in the way forests are managed. It provides mechanisms for mainstreaming the private sector and community participation in the management of state forests to reduce the destruction forest to ensure the sustainable environmental and ecosystem services of forests. The Forest Act promotes the sustainable use of coastal and marine forest resources and recognises the multiple uses of forest resources for socio-economic, cultural and environmental services e.g. riverine and shoreline protection, habitat for wildlife and as catchment areas for water resources. Recognising this multiple use, synchronisation of the provisions of the Water, Wildlife and Forest Acts with those of EMCA, and managed in an integrated way, would result in avoidance of conflict of mandates and foster synergy for the development of the coastal zone.

2.2.9 The Draft Wildlife Policy, 2008

The draft Wildlife Policy provides a framework for conserving Kenya's rich diversity of species, habitats and ecosystems for the benefit of its people and the global community. It recognises the role of various actors in the wildlife management and other related sectors and proposes the restructuring of the KWS to enable it dispense its mandates effectively, devolution of wildlife management responsibilities to local communities and land owners; maintenance of the integrity of protected areas and introduction of new and varied economic incentives for communities, land owners, non-governmental organisations and the private sector. The draft wildlife policy offers incentives to promote community participation in conservation, which is in line with the ICZM principles.

2.2.10 The Draft Tourism Policy, 2009

The revised draft National Tourism policy provides a framework for decision-making by the government, and allows sectoral stakeholders to partner with government to develop the tourism sector and deliver sustainable growth. Seeking to address impacts of sectoral activities on the environment, the economy and socio-cultural aspects, it recognizes that its implementation shall involve streamlining the tourism policy with wildlife, land-use and other cross-cutting policies.

2.2.11 Regional Development Authorities Policy, 2007

The Regional Development Authorities Policy (2007) was formulated to provide the necessary policy and institutional framework to guide the implementation of the mandate of the Ministry of Regional Development Authorities. The overall goal of the policy is to achieve equitable and balanced national socio-economic development through the promotion of sustainable utilization of natural resources for economic development in the regions. The policy addresses the fragmented legal framework and mandates governing the six Regional Development Authorities (RDAs), with a view of providing an integrated approach in coordinating the activities of the RDAs, namely KVDA, LBDA, ENNDA, ENSDA, CDA and TARDA.

The policy revises the mandate of RDAs in order to clarify their role and core business, to minimize operational overlaps and conflicts with national, sectoral and other statutory institutions and development agencies at all levels.

The redefined functions of the RDAs include the following,

- Formulation of integrated regional development plans (IRDPs) in close consultation with other stakeholders,
- Management of natural resources, specifically addressing gaps in regional resource mapping, promotion of resource based investments and formulation of a framework through which communities would benefit from such investments.

The Regional Development Authorities Policy and legal provisions have a direct bearing on streamlining and strengthening the roles and functions of CDA and TARDA in coastal zone development and management.

2.2.12 Summary of the National Policies

The policies commented above in respect of various activities in certain cases have duplications, overlaps, inconsistencies, and a system of very weak enforcement. It is for this reason that the EMCA framework supersedes the sectoral laws. One of the issues that arise with regard to the implementation of the framework and sectoral laws is whether the country has adequate capacity in terms of technical and financial resources to implement the laws, which in both respects; no, the country lacks the sufficient capacities.

This, marked by a general apathy to coastal and marine issues, low public awareness and education concerning coastal and marine issues generally; multiplicity and overlapping jurisdictions without a proper coordinating mechanism, the need for ICZM Policy and mechanisms for its implementation, cannot be over-emphasised.

2.3 Review of the Legislative Framework

2.3.1 Introduction

In addition to the framework environmental law, several sectoral laws, govern the management of coastal and marine environment. This has made coastal management the secondary responsibility of most of these sectors, but a primary responsibility of none, leading to poor governance of the resources, duplication of efforts and wasted resources in both monetary and personnel. In this section, the draft environmental law as well as the sector based laws and institutions relating to coastal zone management are analysed.

2.3.2 Environment Management and Coordination Act, 1999

The Environmental Management and Coordination Act (EMCA), 1999 is the framework law on the environment in Kenya. Section 55 of EMCA institutionalises ICZM as a tool for the management and conservation of the coastal and marine environment; the ICZM policy, which is being finalised, finds a legal anchor in the Act. The Act obliges NEMA "in consultation with the relevant lead agencies" to undertake a survey of the coastal zone and prepare "an integrated national coastal zone management plan, based on the survey."

2.3.3 Review of the Sector based Laws

Kenya's socio-economic activities and processes are organized per sector. As such, policy statements, legislations and corresponding institutions, are also sector based. In this section, the relevant sectoral laws governing the coastal marine environment are briefly analysed:

2.3.3.1 The Fisheries Act, 1991

The Fisheries Act (Cap 378) and its various subsidiary regulations is the instrument for fisheries management in Kenya. The Act restricts destructive practices and protects fish breeding areas. It enforces the outlawed use of under-size nets, beach seining, use of spear guns, and dynamite fishing among others.

Kenya supports the moratorium on whaling in the Indian Ocean and further supports efforts to promote improved management of the Indian Ocean Whale Sanctuary. The maritime zones of Kenya have been declared as sea turtles sanctuary. Sea Turtles are protected from hunting and harassment under the revised Fisheries Act Cap 378 (1991). The Act prohibits any person or vessel in Kenyan waters from fishing sea turtles. A number of restrictions, including seasonal restrictions on trawling, the need for an approved turtle excluder device (TED) on trawlers, ban on the use of monofilament nets, seine nets, harpoons and spear guns have been declared as illegal fishing implements (Kenya Gazette notice no. 7565) . Coral reef fisheries outside of protected areas are covered by this Act.

2.3.3.2 Science and Technology Amendment Act (Cap 250), 1977

Research in the fisheries sector, which is guided by the Science and Technology Amendment Act (Cap 250), is implemented by the Kenya Marine Fisheries Research Institute (KMFRI). The Institute undertakes research in freshwater and marine fisheries, including chemical and physical oceanography, aquaculture, environmental and ecological studies. This assists the country to undertake sustainable exploitation, management and conservation of its fisheries and aquatic environment to achieve food security, poverty reduction, and creation of employment.

2.3.3.3 Merchant Shipping Act of 2009

The Merchant Shipping Act 2009 makes provision for, among other, the registration and licensing of Kenyan ships and ancillary matters; the prevention of collisions and pollution, the safety of navigation and cargoes, maritime security; the control, regulation and orderly development of merchant shipping and related services, and generally consolidating the law relating to shipping and for connected purposes.

The Merchant Shipping Act has a crucial role in regulating shipping activities in the inshore areas and extending to the EEZ, providing for maritime safety and security and pollution control and environmental conservation. The provisions of the Act can be synergistic to the proposed ICZM policy.

2.3.3.4 The Revised Water Act, 2002

To achieve the objectives of the Water Policy, the Water Act (2002), as its implementation instrument, adopted the IWRM principle in the management of water resources. The provisions of this Act mandates the Water Resources Management Authority with wastewater management responsibilities, a role given to NEMA under EMCA resulting in a conflict in responsibilities, therefore the provisions of the Water Act need to be harmonized with those of EMCA, and expanded to capture trans-boundary issues to answer the need for cooperation with other countries in view the shared water bodies.

2.3.3.5 The physical Planning Act, 1996

Sections 4 and 5 of the Physical planning Act of 1996 provide for the preparation and implementation of physical development plans. The Act provides for spatial planning of areas and this could conceivably apply, inter alia, to the unique coastal ecosystems. However, given the sectoral approach to planning, sustainable development cannot be assured. To move away from this, the planning of the coastal areas need to take into consideration environmental concerns and coastal dynamics, in order to address the emerging issues related to the impacts of global warming and sea level rise.

As the spatial plans are a very important statutory tool to ICZM, the Physical Planning Act is creating a shared future of the coastal zone.

2.3.3.6 The Forest Act, 2005

The Act applies to all forests and woodlands on state, local authority and private land. The essence of applying the Forest Act to all forests is to transform all types of forests into viable production systems capable of supporting forest industries besides conservation. The Act facilitates and promotes the participation of the private sector and communities in forest management

The Act has recognised mangrove areas and those covered by coastal forests, including kaya forests, as areas, requiring better management for protecting Kenya's coastline, enhancing conservation and preservation of heritage.

2.3.3.7 The Wildlife Conservation and Management Act, 1985

The current Wildlife (Conservation and Management) Act established the legal provisions for Sessional Paper No. 3 of 1975 on wildlife management in Kenya. The system of wildlife conservation established under the Act contains nature in protected areas in which other forms of land-use are excluded. These areas are put under public control for the propagation, protection and preservation of wild animals' life and wild vegetation and should be ideally subject to minimal alteration or alienation for other forms of land-use activity. The law provides for four types of wildlife protected areas, namely: national parks, national reserves, local sanctuaries and game reserves. Generally, the parks have been successful in excluding fishermen and shell collectors with the exception of late night poaching.

Within the 30 m of the high water mark, critical habitats are protected by this Act, if the area falls within Marine Protected Areas (MPAs) and therefore, coral reefs are protected under this Act. In Marine Reserves, the Act restricts traditional fishing methods. Similarly, seagrass beds, which are not cited directly under any legal instrument, are protected under the Wildlife Conservation and Management Act. The dugong is also a protected species under the third schedule, (protected animals) cited in the Wildlife (Conservation and Management) Act, Cap 376 (revised edition 1985).

2.3.3.8 The Coast Development Act, 1990

This act provides for the establishment of the Coast Development Authority to plan and coordinate implementation of development projects in the whole of the Coast Province and the EEZ. The Act gives powers to the Authority to plan, coordinate, gather and disseminate information, and to generally manage and develop coastal resources in a sustainable manner. In an effort to avoid duplication of efforts and to ensure the best use of available technical resources, the Authority maintains close links with other government institutions and the private sector.

2.3.3.9 National Museums and Heritage Act, 2006

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. It provides for the establishment, control, management and development of national museums, and for identification, protection, conservation and transmission of cultural and natural heritage of 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 as a management tool in development, which allows for remedial action as necessary.

2.4.3.10 Summary

In summary, Kenya is endowed with good legislation for managing its coastal environment. The main problem is the sectoral nature of the legislation, which has failed to see the interconnections between the resources of the coastal environment.

2.4 Review of International Agreements and Conventions

The increasing complexity and interconnectedness of global environmental issues has necessitated world cooperation in addressing them, making Kenya to remain an active participant in signing and/or ratified a number of the international Conventions, Protocols and Agreements environmental protection including those relevant to the coastal and marine environment.

Table X below lists the international agreements and programmes in the various focus areas that help to galvanise focus and political attention on the environment while providing the basis for international and regional cooperation.

Table X: Major Multilateral Environmental 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 Generals Office
London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter(1972)	Dumping at Sea	Ministry of Transport
Protocol to the Convention on Prevention of Marine Pollution by Dumping of Waste and Other Matter (1996)		
International Convention for the Prevention of Pollution from Ships, as amended in 1978(MARPOL 1973/78)	Ship Based Pollution	Ministry of 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 Natural Resources
Basel Convention on the Control of Tran boundary Movement of Hazardous Wastes and Their Disposal(1989)	Hazardous Waste	Ministry of Environment and Natural 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 Natural Resources
Convention on Biological Diversity(1992)	Biodiversity	Ministry of Environment and Natural 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

2.5 Review of Institutional Frameworks

Institutions with mandates on coastal and marine environment management have evolved with time. Starting with the National Environment Secretariat (NES), established in 1974, which co-ordinated environmental activities and chaired the Inter-Ministerial Committee on Environment (IMCE); NES went further to chair the Presidential Commission on Soil Conservation and Afforestation (1981), before the National Environment Management Authority (NEMA), was established in 1999.

NEMA was established by the enactment of the Environmental Management and Coordination Act (EMCA), to exercise general supervision and co-ordination over all matters relating to the environment. The Act also established National Environment Council (NEC), which is charged with policy formulation, setting of national goals, objectives and priorities for the protection of the environment and the promotion of co-operation among public developments, local authorities and other stakeholders. EMCA also established Provincial and District Committees as the representatives of both public and private stakeholders' interests, and charged them with the responsibility of proper management of the environment in their designated areas.

Other institutions capable of cutting across administrative jurisdictions include the Kenya Wildlife Service (KWS, 1989) and the Regional Development Authorities. While KWS mandates are more specific, to ensure that wildlife resources are conserved and used for national economic development and benefit of the people of Kenya; TARDA and CDA advise on co-ordination of development generally, and takes care of development activities along river basins. The CDA mandate in particular has more broad mandates in its area of jurisdiction, with functions such as carrying out surveys and studies that ensure sustainable utilization of coastal resources, including those of the EEZ. The CDA has mandates to develop up-to-date long range development plan for the Coastal area.

The Kenya Maritime Authority (KMA), whose broadest function is administration of the Merchant Shipping Act, giving it mandates in monitoring, regulating and overseeing maritime affairs in the country, also ensures the protection of Kenya's coastal and marine environment. The other institution which has mandates outside its core function includes the Kenya Ports Authority.

Many constraints and limitations with regard to relevant national institutional arrangements for the management of coastal and marine environment and other resources have been identified. There is lack of, or inadequacy of financial and technical resources due to under funding by the Government. The low funding affects the capacity of the institutions to execute their mandates.

Despite the good intentions of each sector institution, overlapping and uncoordinated jurisdictions is leading to duplication of efforts and wasted resources. Government control, inadequate public participation with the private sector, civil society, donors and others, are the other factors which compound the problem. Operating in ministerial or sectoral disciplines excludes coordination, making it difficult to give focused attention to the addressing issues that require multi-juridical involvement. Therefore mainstreaming ICZM into the different sectors would make the ICZM tool a mandate of many agencies.

2.6 Environmental Management Tools

Environmental management tools have been used in Kenya in an attempt to reduce impacts on the environment. Some of such tools include environmental impact assessment and auditing, marine protected areas and integrated coastal zone management. Each of these is discussed briefly hereunder.

2.6.1 Environmental Impact Assessment (EIA)

Environmental Impact Assessment (EIA) is the process of identifying, predicting, evaluating and mitigating the biophysical, social and other relevant effects of development proposals prior to major decisions being taken and commitments made. EIA is a powerful decision-making tool in environmental management and its impact is visible since the enactment of the EMCA (1999) as project proponents are required to submit EIA reports to that assist in determining whether or not the proposed project will be approved depending on its adverse effects on the general environment. The EIA process, guided by the provisions of EMCA (EIA & Audit) Regulations, 2003 has provided a direct role for interested and affected public to participate in management of the environment in a structured approach. It was in the spirit of the Act that several proposed large scale coastal projects e.g. titanium mining and offshore oil exploration received significant public input.

After carrying out an EIA, the precautionary and polluter pays principles may be applied to prevent, limit or require strict liability or insurance coverage to a project, based on its impacts. Actions like drainage, excavation, deposition or introduction of living species into a wetland including coastal zone as well as erection, reconstruction, placement, alteration, removal, or demolition 'of any structure or part of any structure' without an approved EIA are not permitted; and specific regulations on Water Quality and Solid Waste Management have been developed. Preparation of pollution control guidelines is also underway. Thus, proper applications and enforcement of EIA and its provisions may be able to stem off many of the coastal and marine environmental issues, and as the public gains more awareness on the EIA process and its benefits, the country stands to realise more sustainable development of the coastal and marine environment.

2.6.2 Environmental Audit (EA)

Environmental Audits (EAs) are intended to quantify environmental performance and environmental position. EAs aim to define what needs to be done to sustain or improve on indicators such as performance and position. EMCA (1999) provides for Environmental Audits (EA) as a compliance monitoring and evaluation tool to gauge how well existing projects/facilities perform with respect to environmental standards, including appraisal of the production systems, 'environmental regulatory frameworks, environmental health and safety measures, and sustainable use of natural resources, and mitigation of impacts; an undertaking, targeting on-going concerns.

Response to undertake annual audits by various firms in business has been good with over 5,000 EA reports prepared countrywide, with most establishments in the coast, complying. These annual evaluations have assisted in good environmental governance, resulting in corrective measures for subsequent years.

2.6.3 Marine Protected Areas (MPA)

Marine Protected Areas (MPAs) are areas designated to enhance conservation of marine resources and to address the declining state of the marine biodiversity and fisheries. MPAs are important tools for the management of marine biodiversity, populations of over-exploited species and overall health of the oceans. The first MPA was established in Kenya in 1968 when the Malindi/Watamu Marine Park and Reserve was gazetted. Today a total of 9 MPAs have been established in the country. MPAs are provided for in the Wildlife Conservation and Management Act (1989) with the level of protection varying for MPAs designated as reserves or parks. In marine reserves, the Wildlife Act allows some extractive use, while prohibiting others.

Marine parks on the other hand are completely protected from all extractive activities. Under the Act, all biological resources within a park are protected and no removal or disturbance of any living or non-living marine resource is permitted, except as necessary for monitoring or research to evaluate management effectiveness. Decreased human disturbance within MPAs has resulted in increases in the abundance, diversity and productivity of marine organisms with spill over effects, seen in areas adjacent to MPAs. However, as sizes of MPAs have remained relatively small relative to increasing pressure from a growing population, efforts to manage resources sustainably outside the MPAs have necessitated adoption of ICZM as a tool for coastal management across the area.

2.6.4 Integrated Coastal Zone Management (ICZM)

Integrated Coastal Zone Management (ICZM) is a process for the management of the coast using an integrated approach, regarding all aspects of the coastal zone, including the geographical and political boundaries, in an attempt to achieve sustainability. The process is dynamic, multidisciplinary and iterative to promote sustainable management of coastal zones.

Integrated Coastal Zone Management (ICZM) has grown conceptually and operationally in the last four decades since its inception in the USA in the 1970's, gaining widespread acceptance as a management system and vehicle for rational and sustainable utilization of coastal zone resources. In Kenya, the ICZM practice began in 1993/4 following the Arusha Policy Resolutions on the process in 1993.

Kenya's ICZM agenda was spearheaded by the Coast Development Authority (CDA), through two pilot sites to get experience on the process. This was followed by two national workshops share the experience. Support for this was provided by USAID and IUCN.

Later, the Kenya government institutionalized the ICZM process through EMCA of 1999, and NEMA subsequently, constituted an ICZM Policy Steering Committee to oversee the preparation of a draft ICZM policy and a National Plan of Action to implement ICZM activities.

CHAPTER 3

3.0 GOAL, MISSION AND STRATEGIC OBJECTIVES

This chapter introduces the body of the proposed Draft ICZM Policy, currently under finalisation, which the National Plan of Action is to implement.

3.1 *Vision*

A coastal zone with healthy ecosystems and resources that sustain the socio-economic development and well-being of the current and future generations

3.2 *Mission*

To conserve the coastal and marine environment and to ensure that its resources are utilised in a sustainable manner for the benefit of coastal communities and the national economy

3.3 *Guiding Principles*

The guiding principles for the management of Kenya's coastal zone applied in the ICZM-NPA include: -

- i) use of ecosystem-based approach, recognising the relationships and inter-linkages between components of the wider ecosystem in addressing coastal zone management issues, effectively addressing issues affecting ecosystems that stretch beyond the coastal zone administrative area;
- ii) use of a participatory and inclusive approach, which entails involvement of stakeholders, and consensus building on matters of planning, and decision making;
- iii) application of a precautionary approach, is where implementation of measures are undertaken cautiously, adjusting strategy as necessary;
- iv) application of best available science and adaptive management, where the best available knowledge, scientific information and data are used to support application of ICZM;
- v) promotion of stewardship in coastal resource management to ensure sustainable development for posterity;
- vi) application of multiple resource use management, adopting integrated approach to manage ecosystems as a whole jointly to address impacts on both ecosystems and on the environment;
- vii) application of the polluter pays principle, where those who pollute the coastal and marine environment, meet the cost of cleaning and the cost of the pollution to resource users;

- viii) provision for a balance between development and conservation requirements to ensure conservation and sustainable development of the coastal zone;
- ix) domestication of Multilateral Environmental Agreements (MEAs) and Regional Instruments to foster international and regional cooperation for better management of transboundary issues

3.4 Thematic Areas

Six strategic or thematic areas were identified and prioritised for action in the Draft ICZM Policy. These thematic areas are:

Thematic Area 1: *Integrated Planning and Co-ordination*

Thematic Area 2: *Sustainable Economic Development*

Thematic Area 3: *Conservation of the Coastal and Marine Environment*

Thematic Area 4: *Environmental Management and Risks*

Thematic Area 5: *Capacity Building, Education, Awareness and Research*

Thematic Area 6: *Institutional arrangements and Legal Frameworks for ICZM*

3.5 Strategic Objectives

The overall objective of the ICZM Policy is to guide the management and utilization of coastal and marine environment and its resources to ensure sustainable livelihoods and development. The policy specifically seeks to,

- i) Promote integrated planning and coordination of coastal developments across the various sectors;
- ii) Promote sustainable economic development to secure livelihoods of coastal communities;
- iii) Conserve the coastal and marine resources and environment for sustainable development;
- iv) Manage environmental risks associated with changes in shoreline and climate;
- v) Develop capacity in research and education and enhance stakeholder awareness and participation in sustainable resource management;
- vi) Establish effective institutional and legal frameworks for implementation of the ICZM policy;
- vii) Establish sustainable financing mechanisms for the ICZM Policy implementation.

CHAPTER 4

4.0 THEMATIC AREAS AND STRATEGIES

4.1 THEMATIC AREA 1: *Integrated Planning and Coordination*

Development activities in the coastal zone have occurred with less than robust planning and organisation. The planning and management has always been sectoral. This has a result led to changes in land use patterns, affecting negatively both environmental quality and economic stability for the local community.

The goal set for this thematic area is to bring about coordinated planning for the orderly development of the Kenya coast. This will be addressed through the following three strategic objectives: -

1. Planning and Management of Coastal development;
2. Provision of adequate infrastructure and public service;
3. Coordination and communication mechanisms within and between government, community and other stakeholders

Strategic Objective 1: *Planning and management of coastal development*

Development activities in the coastal zone have been sectoral and with little planning and organisation. This has led to changes in land use patterns, affecting negatively environmental quality and threatening the economic stability of local communities. Among other things, the loss of access to the beach and fishing grounds, degradation of critical habits and pollution have affected the ecological and economic functions that support and sustain livelihoods, imposing a requirement for policies that guide planning and management of coastal development.

Strategic Objective 2: *Provision of adequate infrastructure and public service*

With the rapid increase in population, the development of human settlements and urbanization has out-paced the ability of local authorities to provide infrastructure and public services, placing high pressure on existing infrastructure. Consequently, the environment, economic prosperity, public health and the quality of life of coastal communities are undermined, leading to a requirement for appropriate infrastructure strategies that ensure sustainable development.

Strategic Objective 3: *Coordination and communication mechanisms within and between government, community and other stakeholders*

A top-down approach in development planning and management has been exercised by government. There has been poor communication and coordination which has allowed alienation between the different sectors of government, stakeholders and target communities. To overcome this deficiency, strategies that ensure inclusiveness and participation have been given to meet this strategic objective.

Table 1: Integrated Planning and Coordination Strategic Objectives and Strategies

Strategic Objectives	Strategies
SO1: Planning and management of coastal development	<ul style="list-style-type: none"> i) Guide and coordinate planning and management of development in the coastal zone; ii) Put in place appropriate strategies for managing development and growth in the coastal zone; iii) Strengthen the capacity of institutions responsible for coastal planning and development; iv) Integrate development planning in the coastal zone, with issues of environmental safety and aesthetics in harmony with local land use plans; v) Coordinate implementation of the National Land Policies to address issues of land tenure.
SO2: Provision of adequate infrastructure and public service	<ul style="list-style-type: none"> i) Promote and support the provision of amenities and infrastructure; ii) Promote private-public partnership in the delivery of services; iii) Integrate and coordinate implementation of the National Environment Policy to meet environmental objectives in the provision of infrastructure and public services.
SO3: Coordination and communication mechanisms within and between government, community and other stakeholders	<ul style="list-style-type: none"> i) Ensure the support and involvement of relevant administrative bodies and sectors concerned with the management of the coastal area; ii) Ensure the inclusion of communities and all other stakeholders in the planning of coastal zone management programs; iii) Promote strategies that will enhance communication among government, NGOs, CBO's, and communities.

4.2 THEMATIC AREA 2: *Promotion of Sustainable Economic Development*

Over-harvesting of coastal natural resources has resulted in their depletion and in degradation of the habitats that support the resources. A scarcity of the resources has developed, resulting in competition and resource use conflicts. Wise use of the resources will thus be promoted through strategic objectives that promote empowerment of the communities to sustain livelihoods and development of mechanisms that address resource use conflicts.

Strategic Objective 1: *Promotion of community empowerment and sustainable livelihoods*

Traditional natural resource-based economic activities e.g. artisanal fishing and mangrove harvesting have supported local livelihoods for generations. However, habitat destruction and over-harvesting of the resources have resulted in restricted mangrove exploitation and a decline in catches for certain fish species in near-shore waters. This situation has resulted in less income from the traditional resources, forcing young fishers, to switch to other sectors of the economy, leaving older fishermen continuing with the activity, but, with diminished income to meet livelihood needs. Strategies have, as a result been given, to address the promotion of community empowerment and sustain livelihoods.

Strategic Objective 2: *Resolving resource use conflicts and benefits sharing*

Rapid urbanization, high levels of poverty and competition for coastal resources and space is exerting pressure the coastal environment, and has resulted in use conflicts. Tourism development is turning fishing grounds into recreational areas, impeding access to fishing grounds. Increased competition between different service providers in the tourism industry is compounding the conflicts, while revenues generated from tourism, hardly benefit local communities.

Declaration and delineation of Protected Areas without consultation with communities has restricted resource users without providing viable alternatives. While large scale agriculture and fishing generate appreciable incomes, negative environmental and socio-economic impacts from these activities denying local communities land, while prawn trawling destroys seagrass fish habitat and fishing gear used by artisanal fishers. Trans-boundary conflicts have also arisen as a result of destructive fishing methods from neighbouring countries, denied local coastal communities, a fair share of the benefits from exploitation of the fisheries resources despite, suffering the impacts.

To resolve resource use conflicts and rationalise benefit sharing from coastal and marine resources and to balance local and national interests, strategies to enforce rationale use of resources is required.

Table 2: Promotion of Sustainable Economic Development Strategic Objectives and Strategies

Strategic Objectives	Strategies
SO1: Promotion of community empowerment and sustainable livelihoods	<ul style="list-style-type: none"> i) Promote off-shore fishery; ii) Promote alternative livelihoods; iii) Introduce mechanisms for co-management, rehabilitation of coastal ecosystems, and sharing of benefits; iv) Promote shared responsibility with the private sector, NGOs and CBOs in the conservation and management of resources; v) Restore and promote traditional values and practices that ensure sustainable management and exploitation of resources; vi) Promote multi-sectoral approach to the management of coastal resources.
SO2: Resolving resource use conflicts and benefits sharing	<ul style="list-style-type: none"> i) Ensure equity in access to land and water space, and use of coastal resources; ii) Promote zoning schemes that resolve space and on-water use conflicts; iii) Promote awareness and education programmes on resolving use conflicts, environmental impacts of resource use and sustainable exploitation of the resources; iv) Promote a code of conduct for tourists and tourism operators that is sensitive to cultural and religious values of local communities; v) Ensure an increase in benefits to local communities from revenues accrued from the utilization of coastal natural resources in key sectors of tourism, fisheries, mining, ports and others; vi) Promote the development of guidelines on management of wildlife to minimise human wildlife conflicts, while promoting benefit sharing derived from the wildlife.

4.3 THEMATIC AREA 3: *Conservation of the Coastal and Marine Environment*

Coastal ecosystems including freshwater resources, coastal forests, mangroves, coral reefs, sea grass beds, estuaries, deltas, beaches, and sand dunes represent important resources that sustain livelihoods of coastal populations. However, destruction and alterations of these habitats, over-exploitation, and pollution are impacting the ability of these resources to provide livelihood options in addition to undermining their ecosystem functions.

To conserve the coastal and marine environment, six strategic objectives have been developed. These are: -

1. Preserving, Protecting and Restoring the Integrity of Coastal and Mangrove forests
2. Preserving, Protecting and Restoring the Integrity of Coral Reefs and Sea-grass Beds
3. Preserving, Protecting and Restoring the Integrity of Estuaries and Delta
4. Preserving, Protecting and Restoring Beaches and sand dunes
5. Preserve, protect and ensure the integrity of cultural and natural heritage
6. Improving the management of municipal wastewater and solid waste
7. Improving water quality, and
8. Provision of potable water supplies

Strategic Objective 1: *Preserving, Protecting and Restoring the Integrity of Coastal and Mangrove forests*

Conversion of coastal and mangrove forest cover to farmland, and clearing of mangroves for the establishment of salt pans have reduced the land under forest, considerably. Excessive/uncontrolled logging for timber, wood-fuel and charcoal production, illegal cultivation and encroachment, and excision for settlements and agricultural production are major threats to the forests. Climate change is expected to enhance degradation of the forest habitat. To stem these threats, strategies have been given to preserve the integrity of these habitats.

Strategic Objective 2: *Preserving, Protecting and Restoring the Integrity of Coral Reefs and Sea-grass Beds*

The discharge of municipal wastewater, port development, deforestation and bad agricultural practices along coastal river basins and catchment areas, have resulted in high loads of suspended sediments into coastal waters, suppressing coral and sea-grass growth and impacting the biodiversity negatively. Trawling for prawns' is damaging sea-grass habitats. Global warming, causing sea water surface temperatures to rise is resulting in coral bleaching. There is lack of awareness to appreciate the importance of these habitats, and inadequate enforcement of relevant regulations to protect these ecosystems. Implementation of strategies that meet this policy objective is desirable.

Strategic Objective 3: *Preserving, Protecting and Restoring the Integrity of Estuaries and Deltas*

Recent strong human influences have affected the ecological balance of the delta areas. Most notably, draining of land for agriculture and control of water flow for irrigation and hydro-power production, have resulted in reduced stream flow and saltwater intrusion into delta environments, requiring strategies that will mitigate this.

Strategic Objective 4: *Preserving, Protecting and Restoring Beaches and sand dunes*

Marine beaches and sand dunes are the resources for recreation and supply of freshwater in the coastal environment, respectively, supporting livelihood through tourism and water for human and industrial use. However, human influences including infrastructure development along beaches, sand harvesting and poor waste management demand that strategies are put in place to preserve, protect and restore these systems.

Strategic Objective 5: *Preserving, protecting and ensuring the integrity of cultural and natural heritage*

The interlinkage of the cultural and natural heritage makes the coastal region unique and attractive for multi-sectoral investments and developments including expansion of infrastructure, housing, tourism and port development. The developments occur hand-in-hand with population growth and rapid urbanisation, causing increasing demand for agricultural land for food production. However, they exert significant pressure on heritage sites, manifested as encroachment onto national monuments, archaeological sites, and forests. The pressures on heritage result from, among others, inadequate awareness and education, weak legislation and protection programmes and inadequate development plans. This calls for appropriate measures to mitigate the destruction of heritage sites and enhance sustainable management for the socio-economic and cultural development of stakeholders.

Strategic Objective 6: *Improving the management of municipal wastewater and solid waste*

Rapid urbanisation in the coastal area has resulted in the increased generation of large volumes of solid waste and sewage. The development of infrastructure to service this, has generally been lacking, or, inadequate, causing pollution of land and water systems in most urban centres. The effects of this include the spread of water borne diseases, loss of aesthetic value of the environment, and impact on productivity and biodiversity of natural water systems. The strategies given in the table below are meant to realise the policy strategic objective, addressing these problems.

Strategic Objective 7: *Improving water quality*

Pollution from on-site sanitation systems of coastal developments, discharges from municipal wastewater, storm-water, leachate from solid waste and oil spills are the main causes threatening water quality. Groundwater in particular is the most impacted by the extensive use of on-site sanitation systems, a problem compounded by over-extraction of groundwater aquifers, causing, not only salt water intrusion, but

also a decline and scarcity of freshwater. Implementation of the strategies listed below will address these issues and improve on the quality of freshwater sources.

Strategic Objective 8: *Provision of potable water supplies*

Adequate of potable water in large quantities is essential and a key in coastal development. Most coastal urban and rural areas experience deficiencies in the supply of potable water. Consequently a majority of the population has resorted to abstraction of groundwater with tourist beach using the available brackish groundwater for their washroom needs. Over-extraction of groundwater and destruction of water catchments exacerbate the water supply problem and threaten the ecosystem functions of water, requiring policy strategies to address.

Table 3: Conservation of the Coastal and Marine Environment Strategic Objectives and Strategies

Strategic Objectives	Strategies
SO1: Preserve, Protect and Restore the Integrity of Coastal and Mangrove forests	<ul style="list-style-type: none"> i) Ensure mainstreaming of the management of coastal forests and mangroves into land use planning; ii) Promote IWRM strategies to ensure the conservation of water catchments; coastal and mangrove forests; iii) Promote multi-sectoral approach in managing coastal and mangrove forest areas to guide the multiple activities that take place in these two habitats; iv) Promote co-management of coastal and mangrove forests; v) Ensure developments proposed for areas in and adjacent to forest areas are subjected to EIA ; vi) Strengthen the regulations governing protection of coastal and Kaya forests and mangrove areas to facilitate their conservation;
SO2: To Preserve, Protect and Restore the integrity of Coral Reefs and Seagrass Beds	<ul style="list-style-type: none"> i) Regulate fishing, including trawling, and tourism activities in seagrass and coral areas; ii) Promote good land management practices that address the erosion problem, causing siltation on coral reefs and seagrass beds; iii) Promote best practices and develop guidelines and standards for sea-bed mining and oil exploration; iv) Strengthen local authorities to enforce by-laws regulating municipal waste management; v) Implement the National oil spill contingency plan; vi) Promote the build up of knowledge base on the coral reef and seagrass ecosystems through scientific research and monitoring; vii) Promote the use of indigenous knowledge and scientific information in the exploitation and management of coral reef and seagrass resources; viii) Domestication of the United Nations Framework Convention on Climate Change, (UNFCCC), and related Multilateral Environmental Agreements (MEAs).
SO3: Preserve, Protect and Restore the integrity of Estuaries and Deltas	<ul style="list-style-type: none"> i) Ensure good land use practices to manage erosion and minimize the high loads of suspended sediments and siltation; ii) Promote integrated river delta planning and management to rationalize diversion, damming of rivers and flood control and to ensure equitable allocation of freshwater for ecological functions, Declare deltas as conservation areas with zoning regimes to ensure protection of biodiversity in line with the Wildlife Conservation and Management Policy;

	iii) Promote adoption and use of best practices in planning and implementation of river basin development plans for environmental sustainability.
SO4: Preserve, Protect and Restore the Integrity of Beaches and Sand Dunes	<ul style="list-style-type: none"> i) Promote adoption, use and replication of best practises in planning of development near delta and sand dune areas ii) Declare beaches and dune areas as protection areas; iii) Enforce the setback limits in development near beaches and sand dunes
SO5: To preserve, protect and ensure the integrity of cultural and natural heritage	<ul style="list-style-type: none"> i) Promote cultural tourism and ensure proper planning and visitor management to minimize negative cultural impacts on local communities. ii) Promote community participation in the conservation and management of heritage sites through the use of indigenous knowledge and observing cultural values. iii) Promote public private partnership involving local and international agencies in the preservation, conservation and sustainable management of heritage sites. iv) Promote awareness and education for the community and other stakeholders on the importance of cultural and natural heritage in socio-economic development, cultural development and national cohesion. v) Promote the development of alternative non-extractive uses of natural heritage sites for the benefit of the community (e.g. bee keeping, butterfly farming, ecotourism etc.) vi) Enforce EIA regulations to control development in heritage sites
SO6: To improve the management of municipal wastewater and solid waste	<ul style="list-style-type: none"> iv) Strengthen the capacity of local authorities to effectively manage urban waste; v) Promote public-private sector-partnership in waste management; vi) Promote public awareness on good waste management practices to ensure a clean and healthy environment; vii) Enforce the EMCA (Waste Management) Regulations 2006; viii) Develop and implement pollution prevention and control guidelines for the coastal zone
SO7: To improve water quality	<ul style="list-style-type: none"> i) Promote IWRM strategies to safeguard water quality; ii) Enforce EMCA (Water Quality) Regulations 2006; iii) Ensure sustainable extraction of groundwater to control the problem of saltwater intrusion into water aquifers; iv) Promote public awareness on the importance of protecting natural water systems and development; v) Implement the national Oil Spill Response Contingency plan.
SO8: Provision of potable water supplies	<ul style="list-style-type: none"> i) Promote alternative sources of freshwater to reduce pressure on groundwater sources; ii) Promote suitable management strategies that protect water catchments and water supply aquifers; iii) Promote policies that ensure equitable allocation of freshwater for ecological and social needs; iv) Promote public awareness on the importance of protecting natural water systems and development.

4.4 THEMATIC AREA 4: *Environmental Management & Risks*

Shoreline changes occur as a natural phenomenon. The changes can however be induced and exacerbated by human influences, resulting in environmental management risks. Currently, the impact of climate change is compounding the risk associated with shoreline changes.

Two strategic policy objectives have been developed to address this thematic area. They include: -

- 1) To minimize the impacts of shoreline change, and
- 2) Taking into consideration the effects of climate change in the development process

Strategic Objective 1: *Minimizing the impacts of shoreline change*

Mining of sand, limestone and coral, destruction of natural protective systems and construction of structures along the shoreline influence the hydrological cycle, causing shoreline change and instability. For example, the construction of sea-walls to protect capital investment from beach erosion is common practice, but this may interfere with shoreline dynamics and thus exacerbate erosion problems in adjacent unprotected areas. In other areas, beach accretion, attributed to excessive supply of alluvial or lagoonal sediments, is also causing shoreline instability. As the sea level rise, as a result of climate change, the problem is poised to aggravate.

Strategic Objectives 2: *Taking into consideration the effects of climate change in the development process*

Environmental disasters related to cyclic droughts and floods, tsunamis and storm surges, are issues of concern. These issues have been aggravated by climate change, attributed to anthropogenic activities that increase levels of greenhouse gases in the atmosphere, resulting in global warming. Climate change is a phenomenon that is still inadequately understood, but one which is bound to affect our environment and development activities.

Effects of climate change include impacts on forests, wildlife and biodiversity, tourism and agriculture. Higher global temperatures contribute to sea-level rise through melting of glaciers ice caps and through thermal expansion leading to inundation of low lying coastal areas and infrastructure, with adverse impacts on coastal wetlands and marine ecosystems. Other effects of global warming include wet areas getting wetter and dry ones getting dryer, and changed patterns of incidences of disease outbreaks.

Considering the trend in climate change related issues, there is need for information dissemination, systematic research, policy direction and development of strategies for mitigating the effects.

Table 4: Environmental Management & Risks Strategic Objectives and Strategies

Strategic Objectives	Strategies
SO1: To minimize the impacts of shoreline change	<ol style="list-style-type: none"> i) Develop and implement a Shoreline Management Plan for the entire coast based on an understanding of the natural coastal processes and dynamics; ii) Ensure that land use plans along the shoreline are informed by the Shoreline Management Plan and monitoring data; iii) Harmonise, strengthen and enforce the regulations guiding development along the land/water interface.
SO2: To take into consideration the effects	<ol style="list-style-type: none"> i) Implement the strategy for protection of the coastal area against the impacts of climate change;

of climate change in the development process	<ul style="list-style-type: none"> ii) Promote study of the vulnerability and resilience of the coastal resources to the impacts of climate change; iii) Develop early warning systems for natural disasters such as Tsunami and effects of sea-level rise and its effect and impact on vulnerable areas; iv) Promote sharing and dissemination of knowledge and technology in the response to climate change; v) Promote the implementation of appropriate preventive and adaptive measures to mitigate against the impacts of climate change.
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4.5 THEMATIC AREA 5: *Capacity Building, Education, Awareness, and Research*

Lack in capacity, education, awareness and research in institutions and in insufficient human resources to address coastal zone management issues have been identified as bottlenecks to sustainable coastal development. To address the inadequacy, two strategic objectives are presented. These include:

1. Education, awareness and information programs focusing on coastal zone management, and
2. Research and monitoring programs focusing on the coastal zone

Strategic Objective 1: *Education, awareness and information programs focusing on coastal zone management*

Improving levels of education and access to information on coastal zone issues imparts knowledge and creates awareness on coastal zone management. Involvement and participation of the community and other stakeholders in planning and development of ICZM strategies promote ownership and stewardship of activities and further successful implementation and sustainability of coastal programmes. As such, strategies are presented to realise this strategic objective of the policy.

Strategic Objective 2: *Research and monitoring programs focusing on the coastal zone*

Effective coastal zone planning and management requires a thorough understanding of the driving forces that influence the area dynamics, including trans-boundary factors. This requires data on trends and use of the area. Presently, efforts at relevant research and monitoring programmes focusing on the coastal zone are modest and uncoordinated. This policy objective will be realised through strategies of coordinated research and monitoring programmes that generate data and information to be shared between the researcher and those implementing coastal zone actions.

Table 5: Capacity Building, Education, Awareness, and Research Strategic Objectives and Strategies

Strategic Objectives	Strategies
SO1: Education, awareness and information programs focusing on coastal zone management	<ul style="list-style-type: none"> i) Develop and implement an ICZM Education and Awareness strategy; ii) Mainstream traditional knowledge and practice in the conservation, planning and management of coastal resources; iii) Establish mechanisms for information dissemination to decision makers, communities and other stakeholders;

	iv) Promote the integration of environmental best practises into the activities of government, developers, communities and other stakeholders; v) Support the scaling-up of best practices in coastal resources management.
SO2: Research and monitoring programs focusing on the coastal zone	i) Promote the coordinated generation and dissemination of data and information, for use in planning and decision making; ii) Establish information databases on coastal resources to support decision making.

4.6 THEMATIC AREA 6: *Institutional Arrangements and Legal Frameworks*

Single sector institutional arrangement and legal frameworks, lacking in mechanisms for coordination have been blamed for the poor planning of development in the Kenya coast. To address this gap, two strategic objectives have been identified for implementation to strengthen the institutional arrangements and legal framework for ICZM. They include: -

1. Addressing the complex multi-sectoral problems of coastal areas;
2. Instituting Legal framework for ICZM

Strategic Objective 1: *Addressing the complex multi-sectoral problems of coastal areas*

NEMA, in consultation with the relevant lead agencies is mandated to prepare an integrated national coastal zone management plan and to coordinate implementation of environmental projects and programmes for the sustainable development of the region and its resources. This will be achieved through strategies that bring synergy, cooperation and close collaboration of national lead agencies, local government, research institutions, private sector, CBOs and NGOs.

Strategic Objective 2: *Legal framework for ICZM*

Current legislation and policy were formulated to capture sector specific management issues. The result has been conflicting legislation, duplication of effort, and weaknesses in policy implementation and enforcement. EMCA has provided for the harmonisation of this.

Table 6: Institutional Arrangements and Legal Frameworks Strategic Objectives and Strategies

Strategic Objectives	Strategies
SO1: Addressing the complex multi-sectoral problems of coastal areas	i) Put in place institutional framework to guide the ICZM process. The framework will encompass all major stakeholders from government as well as private sector; ii) Finance the operations of the ICZM process and institutional arrangements.
SO2: Putting in place conducive legal frameworks for ICZM	i) Enact legislation on integrated coastal zone planning and management; ii) Provide for financial arrangements to sustain implementation of the plan ; iii) Harmonise existing policy and legal frameworks in order to mainstream coastal zone management into sector management

CHAPTER 5

5. IMPLEMENTATION PLAN

5.1 Implementation Framework

The National Plan of Action provides the framework for implementation of the proposed Draft ICZM Policy, which is currently in the process of endorsement. This framework provides for capacity building and mechanisms for financing, for which the ICZM NPA is to benefit from.

5.1.1 Capacity Building

Training shall be undertaken to build capacity at both national and local level institutions that will be involved in implementing the ICZM-NPA

5.1.2 ICZM-NPA Implementation and Policy Enforcement

In order to implement this ICZM Plan, mechanisms must be put in place for its enforcement.

5.1.3 Implementation plan

The detailed Implementation Plan is presented in the Matrix below. The matrix provides the Policy Themes, the Strategic Objective(s), Expected Outcome as well as Strategies and respective Key Activities for each Policy Theme. Also in the matrix are Objectively Verifiable Performance Indicators, Targets, and Timeframes for implementation as well as partnerships. Included in the matrix are also the Project Costs.

Therefore budgets should be prepared in a process developing project documents. A first step will be to develop project sheet for each of the proposed activities, 1 to 2 pages in length, outlining the budget requirements. This should be done in sessions with the relevant institutions responsible for the action portioned to them, allowing for mainstreaming ICZM into sector planning.

It is important to note that the Plan Implementation Matrix will be a critical and important management tool for:

- i) Informing the development of project concepts and project proposals'
- ii) Mobilizing, allocating and utilizing resources during plan implementation;
- iii) Management and coordination of plan implementation efficiently and effectively;
- iv) Soliciting collaboration and support from partners and all other stakeholders in the coastal zone;
- v) Monitoring progress, evaluating results/outputs and assessing outcome/impact, documentation and dissemination of results of impact;

- vi) Facilitating mid-term and end-of-plan reviews/evaluations

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INTEGRATED COASTAL ZONE MANAGEMENT – PLAN OF ACTION
IMPLEMENTATION MATRIX

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CHAPTER 6

6. MONITORING AND EVALUATION PLAN

6.1 Introduction

The successful implementation of the strategic plan will depend on how effectively the planned activities and outputs are monitored and evaluated with a view to ensuring that the plan implementation remains on course. M&E plan will ensure the ICZM-THEMATIC AREAS identified strategic objectives, strategies; expected outputs, targets and timeframes are achieved. An effective and results based monitoring and evaluation system will be set up that will guarantee continuous monitoring using the identified indicators.

6.2 Institutional Framework for Monitoring and Evaluation

A Team will be formed that will provide leadership in ensuring effective NPA monitoring and evaluation comprising of senior officers from relevant divisions/sections and will be chaired by the chief executive officer of NEMA. The relevant Coordinating Agency will provide day to day coordination in ensuring monitoring and that evaluation of activities is done in the most efficient manner where regular meetings will be held to discuss the strategic plan implementation. The M&E Team will hold meetings once every quarter where progress towards achievement of the various strategic objectives will be evaluated. The team will focus on whether existing or new approaches that have been developed and adopted are working effectively, implementation status challenges encountered and possible remedies.

6.3 Data Collection Processing and Analysis

Data will be collected through secondary sources field visits supervision missions workshop exchange visits sample surveys and in depth investigation. All collected data will be processed and analyzed through use of computerized system. In order to guarantee efficient repository of generated information, the Coordinating Body will maintain databases that capture the information needed for M&E databases.

6.4 Progress Reports

Monitoring will be continuous and three different reports will be prepared that describe actions taken towards achieving specific outcomes and strategies of the plan.

- i) Quarterly progress report: quarterly progress reports shall include information on key process and output indicators against set targets for the quarter. The quarterly progress report shall be used for reviewing progress and forward planning by project implementers;
- ii) Semi- annual progress report: this report will capture the same information as the quarterly report, but with an additional report consolidating information for the quarter reports.

- iii) Annual review report: at the end of every calendar or financial year, annual progress report will be prepared that objectively highlights key achievements against set targets (both physical progress and financial status), constraining factors lessons learned and recommendations on the way forward.

6.5 Communication/ Dissemination of Reports

The Coordinating Body will put in place a dissemination strategy to ensure that reports are widely disseminated to influence effective programme management and policy making. Forums like meetings review workshop retreats and seminars will be organized annually for the ICZM Committee and stakeholders to share findings and recommendations of the reports. Other channels like newsletter news release press conference public debate and electronic (e-mails internet, websites) transmission will also be used.

6.6 Evaluation Mechanisms

A mid term and a terminal evaluation of the NPA are foreseen during the plan period. The evaluation will entail the following: measuring actual performance against target levels and establishing variances, if any; identifying the casual factors for the variance; and identifying & recommending appropriate remedial measures including a review of the objectives and/or strategies. A monitoring and evaluation Team will ensure these two important evaluations are carried out.

6.7 Linking M&E to Performance Management

The M&E will be an integral part of a performance management system and will be linked to staff appraisal and reward system. The Coordinating Body will monitor and evaluate its activities and performance in the process of reporting on its performance contract on quarterly and annual basis.

7. REFERENCES

Draft ICZM Policy
State of the Coast Report
Strategic Action Plan
Trans-boundary Diagnostic Analysis
NPA South Africa
NPA Belize
Atlas of Coastal Resources
Management of the Kenya Coast, Tim macClanahan et al.,

8. ANNEXES

INTEGRATED COASTAL ZONE MANAGEMENT NATIONAL PLAN OF ACTION (ICZM NPA) ICZM PLAN IMPLEMENTATION MATRIX

Thematic Area	Strategic Objective	Action Strategies	Expected output	Actions	Performance Indicator	Responsibility & Partners	COST	Duration
TA 1: Integrated Planning and Coordination	SO 1.1: Planning and Management of Coastal Development	STRAT 1.1.1: Guide and coordinate planning and management of development in the coastal zone	OUT 1.1.1.(i): Guidelines developed and published	ACT 1.1.1.(i): Develop guidelines for integrated coastal area management and planning	PI 1.1.1.(i): Integrated coastal area management and planning guidelines	Lands, CDA, NEMA, local authorities, KWS, NGOs, CBOs,	5,000,000	1 year
			OUT 1.1.1.(ii): Baseline GIS for coastal zone spatial analysis developed	ACT 1.1.1.(ii): Develop and maintain baseline GIS for coastal zone resources, land use, and critical ecosystems	PI 1.1.1.(ii): Up-to date baseline GIS system	Lands, NEMA, Local government, KMFRI, Physical planning	5,000,000	5 years
			OUT 1.1.1.(iii): Zone plans developed	ACT 1.1.1.(iii): Develop action area/zone plans for various ecosystem and development areas	PI 1.1.1.(iii): At least 5 action area/zones included in the regional, local and special area plans	Lands, NEMA, Local government, CDA, all sectors, civil society	25,000,000	5 years
			OUT 1.1.1.(iv): Urban environmental profiles for all towns developed	ACT 1.1.1.(iv): Develop urban environmental profiles to facilitate planning for various activities	PI 1.1.1.(iv): State of the urban environment profiles (Mombasa, Malindi, Lamu, Kilifi, Ukunda, Mtwapa, kwale)	Lands, NEMA, Local government, CDA, all sectors, civil society	10,500,000	5 years
			OUT 1.1.1.(v): Coast regional physical development plan generated	ACT 1.1.1.(v): Develop physical development plan for the coast	PI 1.1.1.(v): Coastal regional physical development plan	Lands, NEMA, Local government, CDA, all sectors, civil society	35,000,000	5 years
			OUT 1.1.1.(vi): Land capability and land-use plans developed	ACT 1.1.1.(vi): Up-date and develop land capability and land use plans	PI 1.1.1.(vi): Land capability and land-use plans	Lands, NEMA, Local government, CDA, all sectors, civil society	6,000,000	2 years
			OUT 1.1.1.(vii): A strengthened ICZM committee	ACT 1.1.1.(vii): Strengthen the ICZM steering committee to assist in development and environmental control.	PI 1.1.1.(vii): A strong ICZM committee	Lands, NEMA, Local government, CDA, all sectors, civil society	10,000,000	5 years

			OUT 1.1.1.(xi): Management Information System in place	ACT 1.1.1.(ix): Establish a shared natural resource management information system	PI 1.1.1.(ix): NRM Information management system	NEMA, Lands, CDA, Local authorities, KMFRI, NGOs, stakeholders	4,000,000	2 years
			OUT 1.1.1.(x): Environmental and socio-economic concerns mainstreamed in planning	ACT 1.1.1.(x): Mainstream environmental and socio-economic concerns including climate change in planning and development	PI 1.1.1.(x): Development plans incorporating environmental and socio-economic concerns	Ministry of planning, national development and vision 2030, CDA and other agencies	3,000,000	2 years
		STRAT 1.1.2: Put in place appropriate strategies for managing development and growth in the coastal zone	OUT 1.1.2.(i): Strategic plan developed for the coastal zone	ACT 1.1.2.(i): Develop strategic plan for management of development and growth of coastal zone	PI 1.1.2.(i): Strategic coastal development plan for the coastal zone	Local governments, CDA, lands, stakeholders	20,000,000	2 years
			OUT 1.1.2.(ii): District development plans implemented	ACT 1.1.2.(ii): Support implementation of district development plans for all the Districts in the Coast Province	PI 1.1.2.(ii): Coastal districts' development plans implementation Programme	Local governments, all stakeholders		
			OUT 1.1.2.(iii): M & E tools developed	ACT 1.1.2.(iii): Develop Monitoring and Evaluation tools to be used by the ICZM committee.	PI 1.1.2.(iii): M&E tools	NEMA, CDA, Stakeholders	3,000,000	1 year
			OUT 1.1.2.(iv): Harmonised development plans for coastal districts and constituencies	ACT 1.1.2.(iv): Harmonise district development plans and constituency development plans	PI 1.1.2.(iv): Harmonised district and constituency plans	CDA, TARDA, Planning ministry, local government	5,000,000	2 years
			OUT 1.1.2.(vi): Coastal ecosystem carrying capacity assessment established and included within the management information system (database)	ACT 1.1.2.(vi): Assess the carrying capacity of various coastal ecosystems	PI 1.1.2.(vi): Carrying capacity of various ecosystems	KMFRI, NEMA, KFS, KWS, NGOs, DRS, Fisheries	50,000,000	5 years

			OUT 1.1.2.(vii): Inventory and profiles of available natural resources	ACT1.1.2.(vii): Inventorize and profile the available stocks with respect to various natural resources	PI 1.1.2.(vii): Stocks inventory profiles generated and incorporated into the management information system	KMFRI, NEMA, KFS, KWS, NGOs, DRS, Fisheries	30,000,000	5 years
			OUT 1.1.2.(viii): Joint enforcement operations	ACT1.1.2.(viii): Support joint enforcement of EIA, EA, water quality, waste, biodiversity regulations	PI 1.1.2.(viii): Number of joint enforcements	NEMA and lead institutions	10,000,000	5 years
		STRAT 1.1.3: Strengthen the capacity of institutions responsible for coastal planning and development	OUT 1.1.2 Capacity development plans for institutions with planning mandate supported	ACT1.1.3.(i): Support capacity development plan for all institutions with planning mandate.	PI 1.1.3 (i): Capacity development plans	Physical Planning, NEMA and stakeholders	5,000,000	1 year
		STRAT 1.1.5: Coordinate implementation of the national land policies to address issues of land tenure	OUT 1.1.5 (i) Land tenure issues in the coastal region addressed	ACT1.1.5.(i): Implement Land policy to address land tenure issues in the coastal region	PI 1.1.5.(i): Reduction in land tenure issues in the coastal zone	Ministry of Lands, NEMA and stakeholders	3,000,000	5 years
	SO 1.2: Provision of Adequate Infrastructure	STRAT 1.2.1: Promote and support the provision of amenities and infrastructure	OUT 1.2.1.(i) Environmental standards mainstreamed in infrastructure development	ACT1.2.1.(i): Enforcement of environmental regulations and standards in the provision of infrastructure and amenities.	PI 1.2.1.(i): Environmental quality standards	NEMA, water ministry, physical planning, fisheries and other stakeholders	10,000,000	5 years
		STRAT 1.2.2: Promote private-public partnership in the delivery of services	OUT 1.2.2.(i): ICZM PPP strategy	ACT1.2.2.(i): Mainstream the Government policy on PPP in ICZM	PI 1.2.2.(i): Number of PPPs initiatives in support of ICZM	NEMA, CDA, Private sector	5,000,000	5 years
			OUT 1.2.2.(ii): Mechanisms/incentives to encourage private sector investment developed	ACT1.2.2.(ii): Develop and implement mechanisms/incentives to encourage private sector investment in the use and conservation of natural resources	PI 1.2.2.(ii): Number of mechanisms/incentives	NEMA and stakeholders	15,000,000	5 years

		STRAT 1.2.3: Integrate and coordinate implementation of the National Environment Policy to meet environmental objectives in the provision of infrastructure	OUT 1.2.3.(i): Sessional paper on Environment	ACT1.2.3.(i): Complete and adopt the National Environmental Policy into a Sessional Paper	PI 1.2.3.(i): Sessional paper	Ministry of environment	2,000,000	2 years
	SO 1.3: Coordination and Communication Mechanisms within and between Government, Community and other Stakeholders	STRAT 1.3.1: Ensure the support and involvement of relevant administrative bodies and sectors concerned with the management of the coastal area	OUT 1.3.1.(i): PECs and DEC's strengthened	ACT1.3.1.(i): Strengthen the District Environment Committee and the Provincial Environment Committee	PI 1.3.1.(i): Number of meetings and participants in DEC and PEC	NEMA	5,000,000	5 years
			OUT 1.3.1.(ii): ICZM activities included in PC of collaborating agencies	ACT1.3.1.(ii): Mainstream ICZM proposed activities into Performance contracts of the collaborating agencies	PI 1.3.1.(ii): Number of PCs with ICZM incorporated	All participating agencies	5,000,000	5 years
		STRAT 1.3.2: Ensure the inclusion of communities and all other stakeholders in the planning of coastal zone management programs	OUT 1.3.2.(i): Community and other stakeholders planning forum established	ACT1.3.2.(i): Establish a forum for community and other stakeholders participation in planning and access to information	PI 1.3.2.(i): Number of meetings and diversity of participation	NEMA and stakeholders	5,000,000	5 years
			OUT 1.3.2.(ii): Community-based development plans	ACT1.3.2.(ii): Embrace community demand driven developmental planning approach	PI 1.3.2.(ii): Number of plans	CDA, TARDA, Planning ministry, local government, and stakeholders	5,000,000	5 years

		STRAT 1.3.3: Promote strategies that will enhance communication among government, NGOs, CBOs and communities	OUT 1.3.3.(i): Communication Strategy developed and implemented	ACT1.3.3.(i): Develop and implement communication strategy that supports participatory development planning at all levels and among all stakeholders	PI 1.3.3.(i): Communication strategy	NEMA, CDA and stakeholders	5,000,000	1 years
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Thematic Area	Strategic Objective	Action Strategies	Expected output	Actions	Performance Indicator	Responsibility & Partners	COST	Duration
TA 2: Promotion of Sustainable Economic Development	SO 2.1: Promotion of Community Empowerment and Sustainable Livelihoods	STRAT 2.1.1: Promote off-shore fishery	OUT 2.1.1.(i): Increased Exploitation of off-shore fisheries by local fishers	ACT2.1.1.(i): Empower local fishers to venture off-shore	PI 2.1.1.(i): Landings from off-shore fisheries	Fisheries, NGOs, CDA	100,000,000	5 years
		STRAT 2.1.2: Promote alternative livelihoods	OUT 2.1.2.(i): Diversified economic base	ACT2.1.2.(i): Empower local communities to diversify means of livelihood	PI 2.1.2.(i): Number of livelihood options	All Stakeholders	200,000,000	5 years
		STRAT 2.1.3: Introduce mechanisms for co-management, rehabilitation of ecosystems, and sharing of benefits	OUT 2.1.3.(i): Well conserved CMAs	ACT2.1.3.(i): Establish community managed areas in marine and terrestrial environment	PI 2.1.3.(i): The number of CMAs and CMA agreements	KWS, KFS, Ministry of Fisheries, CBOs and NGOs, NEMA	50,000,000	5 years
		STRAT 2.1.5: Restore and promote traditional values and practices that ensure sustainable management and exploitation of resources	OUT 2.1.5.(i): Traditional knowledge and best practices documented and mainstreamed.	ACT2.1.5.(i): Document traditional knowledge as well as best practices and mainstreaming into natural management systems.	PI 2.1.5.(i): Report & publications on traditional knowledge and best practices. Traditional best practices incorporated in extension programs	NMK, KWS, Ministry of Fisheries, KFS, CBOs & NGOs, KMFRI	10,000,000	5 years

		STRAT 2.1.6: Promote multi-sectoral approach to the management of coastal resources	OUT 2.1.6.(i): Community based ICZM initiatives	ACT2.1.6.(i): Community involvement and participation in ICZM planning & implementation	PI 2.1.6.(i): Number of community based initiatives within the ICZM framework	CDA, NEMA and stakeholders	50,000,000	5 years
	SO 2.2: Resolving Resource use Conflicts and Benefit Sharing	STRAT 2.2.1: Ensure equity in access to land and water space and use of coastal resources	OUT 2.2.1.(i): Equitable access to marine & coastal resources	ACT2.2.1.(i): Promote access and establish benefit sharing schemes.	PI 2.2.1.(i): Benefit sharing schemes enacted.	NEMA and stakeholders	5,000,000	5 years
		STRAT 2.2.1:	OUT 2.2.1.(ii): Conflict resolution mechanisms established	ACT2.2.1.(ii): Establish conflict resolution mechanisms	PI 2.2.1.(ii): Number of conflict resolution mechanisms.	NEMA, CDA, Fisheries, KWS, NGOs and stakeholders	5,000,000	5 years
		STRAT 2.2.3: Promote awareness and education programs	OUT 2.2.3.(i): Awareness and education programs	ACT2.2.3.(i): Establish awareness and education programs	PI 2.2.3.(i): Number of awareness and education programs in regard to conflict resolution	NEMA, CDA, Fisheries, KWS, NGOs and stakeholders	10,000,000	5 years
		STRAT 2.2.4: Promote a code of conduct sensitive to cultural and religious values of local communities	OUT 2.2.4.(i): Visitors sensitised to cultural and religious values	ACT2.2.4.(i): Establish acceptable code of conduct related to cultural and religious to local communities.	PI 2.2.4.(i): Codes of conduct related related to cultural and religious values	Ministry of Tourism, NMK & Coordinating body	5,000,000	5 years
		STRAT 2.2.6: Strengthen the guidelines for management of wildlife to minimize human wildlife conflicts.	OUT 2.2.6.(i): Resolutions and by-laws of human-wildlife conflicts implemented	ACT2.2.6.(i): Support implementation of regulations and by-laws to address human-wildlife conflicts	PI 2.2.6.(i): Proportion of conflicts solved	KWS, Local authority, Fisheries, NGOs, KFS	5,000,000	5 years

Thematic Area	Strategic Objective	Action Strategies	Expected output	Actions	Performance Indicator	Responsibility & Partners	COST	Duration
TA 3: Conservation of the Coastal and Marine Environment	SO 3.1.: Preserve, Protect and Restore the Integrity of Coastal and Mangrove forests	STRAT 3.1.1: Ensure mainstreaming of the management of critical habitats including coastal forests and mangroves into land use planning	OUT 3.1.1.(i): Critical habitats inventories and valuation carried out	ACT3.1.1.(i): Conduct inventories and valuation of critical habitats including coastal forest to generate accurate baseline information	PI 3.1.1.(i): Critical habitats inventories and valuation reports	KFS, Ministry of Forestry, KWS, Physical Planning Department	5,000,000	2 years
			ESAs mapped and Management Plans developed and implemented	Map ecologically sensitive areas (ESA) and develop management plans for the areas	ESA maps and survey reports, Site specific EAS management Plans	KWS, KMFRI, NEMA, Physical Planning, Fisheries	30,000,000	5 Years
			OUT 3.1.1.(ii): Socio-economic evaluation for critical habitats carried out	ACT3.1.1.(ii): Conduct a socio-economic assessment of utilization of critical habitats including coastal and mangrove resources	PI 3.1.1.(ii): Critical habitats assessment Reports	KFS, Ministry of Forestry, KWS, Physical Planning Department	5,000,000	2 years
			OUT 3.1.1.(iii): Integrated Management plans for critical coastal habitats developed	ACT3.1.1.(iii): Develop integrated management plans for critical habitats including coastal and mangrove forests	PI 3.1.1.(iii): Integrated critical habitats management plans	KFS, Ministry of Forestry, KWS, Physical Planning Department	5,000,000	2 years
			Existing MPAs network expanded through co-management approach	Expand the current MPAs network through establishment of co-managed MPAs	At least 2 new MPAs	KWS collaborating with relevant stakeholders	30,000,000	5 years
			critical habitats monitoring and evaluation plan developed and implemented	Develop and implement a critical habitats and shoreline monitoring and evaluation plan/strategy	Critical habitats monitoring and evaluation plans	NEMA, KFS, KWS, KMFRI, community groups	15,000,000	2 years
			Coastal zone environmental	Develop and adopt indicators for monitoring and reporting on State of the Coast Environment	Coastal zone environmental change indicators	NEMA, KWS, TOURISM, KMFRI, NGOs, Fisheries, Planning,	3,000,000	2 years

			change indicators developed					
			Monitoring Strategy in support of state of coast reporting developed	Develop and implement Monitoring Strategy in support of state of coast reporting	Monitoring Strategy in support of state of coast reporting	NEMA, lead government Institutions, NGOs, CBOs	6,000,000	5 years
			MEAs relevant for coastal zone conservation domesticated and implemented	Domesticate and implement MEAs relevant regional and international instruments	Number of MEAs domesticated and implemented	NEMA, MEMR, stakeholders		
		STRAT 3.1.2: Promote IWRM strategies to ensure the conservation of water catchments; coastal and mangrove forests	OUT 3.1.2.(i): Stakeholder inventory	ACT3.1.2.(i): Develop and inventory of stakeholder involved in coastal forest and catchment areas	PI 3.1.2.(i): Efficient IWRM program	WRMA, KFS	2,000,000	1 year
			OUT 3.1.2.(ii): Delineated maps Sites restored	ACT3.1.2.(ii): Map catchment areas and identify degraded areas for rehabilitation	PI 3.1.2.(ii): Land use maps & Environmental Quality Objectives (EQOs)	WRMA, KFS	5,000,000	2 years
		STRAT 3.1.3: Promote multi-sectoral approach in managing coastal and mangrove forest areas	OUT 3.1.3.(i): Functional partnerships	ACT3.1.3.(i): Forge partnerships with the private sector for commercial plantations.	PI 3.1.3.(i): Number of PPPs	Forestry, KMFRI, KWS, CDA,	7,000,000	5 years
			OUT 3.1.3.(ii): Healthy forest system	ACT3.1.3.(ii): Encourage development and implementation of non-consumptive critical habitats use e.g. bee keeping, tourism, alternative energy sources etc	PI 3.1.3.(ii): Number initiated	Forestry, KMFRI, KWS, CDA	3,000,000	5 years

			OUT 3.1.3.(iii): Payment for Ecosystem Services (PES) schemes developed and implemented	ACT3.1.3.(iii): Develop and implement schemes on Payment for Ecosystem Services (PES)	PI 3.1.3.(iii): s Number of PES	Forestry, KMFRI, KWS, CDA, Private sector	10,000,000	5 years
		STRAT 3.1.4: Promote co-management of coastal and mangrove forests	OUT 3.1.4.(i): Co-managed conservation areas established	ACT3.1.4.(i): Strengthen community involvement in coastal forest management through co-management initiatives	PI 3.1.4.(i): Co-managed conservation areas	KFS, KWS, Fisheries, CDA	15,000,000	5 years
			OUT 3.1.4.(iii): Healthy forest systems	ACT3.1.4.(iii): Restore degraded forests	PI 3.1.4.(iii): Number of Model pilot industries.	KFS, KWS, Fisheries, CDA	5,000,000	4 years
		STRAT 3.1.5: Ensure developments proposed for areas in and adjacent to critical habitats including shoreline and forest areas are subjected to EIA	OUT 3.1.5.(i): Developments compliant with Environmental regulations	ACT3.1.5.(i): Conduct environmental assessment for existing establishments along shoreline and propose corrective measures where necessary	PI 3.1.5.(i): EIA/Audit reports, joint shoreline inspection and monitoring reports	NEMA and lead government institutions	6,000,000	5 years
		STRAT 3.1.6: Strengthen the regulations governing protection of critical habitats including MPAs, coastal forests, including mangroves to facilitate their conservation	OUT 3.1.6.(i): Enhanced capacity in enforcement of regulations	ACT3.1.6.(i): Invest in capital and human capacity on critical habitats including forest conservation	PI 3.1.6.(i): Number of training sessions	Ministry of Forestry, KWS, NMK	5,000,000	5 years
			Critical habitats conservation guidelines developed	Develop and implement guideline for conservation and management of critical habitats	Critical habitats management guidelines	NEMA, Ministry of Forestry, KWS, NMK, KMFRI, Fisheries	3,000,000	2 years

			Best practice guidelines for coastal mining developed	Develop best practice guidelines for coastal mining	Best practice guidelines for coastal mining	NEMA, Mines and Geology Department	2,000,000	
			OUT 3.1.6.(ii): Harmonised regulations	ACT 3.1.6.(ii): Harmonize sectoral regulations governing coastal forests and mangroves	PI 3.1.6.(ii): Number of regulations harmonised	Ministry of Forestry, Water & Irrigation, Fisheries	4,000,000	2 years
			OUT 3.1.6.(iii): Informed community on conservation of critical habitats including coastal forests and mangroves	ACT 3.1.6.(iii): Undertake critical habitats conservation education and awareness programs	PI 3.1.6.(iii): Number of training and awareness programs	Ministry of Forestry, KWS, CDA	11,000,000	5 years
			OUT 3.1.6.(iv): Established PPP	ACT 3.1.6.(iv): Forge public private partnerships to co-manage coastal and marine resources	PI 3.1.6.(iv): Number of successful PPPs.	Ministry of Forestry, KWS, CDA	10,000,000	5 years
			OUT 3.1.6.(v): Bylaws strengthened and harmonized with national laws	ACT 3.1.6.(v): Strengthen bylaws to provide for coastal forests and mangroves conservation	PI 3.1.6.(v): Number and types of bylaws	Ministry of Forestry, NEMA, KWS	6,000,000	2 years
		STRAT 3.1.7: Strengthen the guidelines on management of wildlife to discourage encroachment of human population into forest boundaries for settlement and farming activities	OUT 3.1.6.(vi): Secure forest boundaries	ACT 3.1.7.(ii): Secure wildlife corridors and create buffer zone	PI 3.1.7.(ii): Number of wildlife corridors and buffer zones	KWS, KFS	10,000,000	5 years

	SO 3.2: To Preserve, Protect and Restore the integrity of Coral Reefs and Seagrass Beds	STRAT 3.2.1: Regulate fishing, including trawling, and tourism activities in seagrass and coral areas	OUT 3.2.1.(i): Maximum Sustainable Yields (MSY)	ACT3.2.1.(i): Assess fisheries sustainability status through stock assessment	PI 3.2.1.(i): Status report	Fisheries Department, KWS, Tourism	3,000,000	1 year
			OUT 3.2.1.(ii): Critical habitats vulnerability studies conducted	ACT3.2.1.(ii): Conduct critical habitat vulnerability studies	PI 3.2.1.(i): Vulnerability assessment reports	Fisheries Department, KWS, Tourism	3,000,000	1 year
			OUT 3.2.1.(iii): Management plan plans	ACT3.2.1.(iii): Develop joint coral reefs management plans	PI 3.2.1.(iii): Number of Management Plans	Fisheries Department, KWS, Tourism	3,000,000	2 years
			OUT 3.2.1.(iv): Enhanced compliance with fishing regulations	ACT3.2.1.(iv): Enforce law and regulations on fishing gear	PI 3.2.1.(iv): Proportion of gear complying	Fisheries Department, KWS, Tourism	1,000,000	5 years
		STRAT 3.2.2: Promote good land management practices that address the erosion problem, causing siltation on coral reefs and seagrass beds	OUT 3.2.2: (ii) Natural coastal information systems developed	ACT3.2.2.(v) Strengthen/expand natural resource information system	ii) IMS	Planning, NEMA, CDA	10,000,000	5 years
			OUT 3.2.2: (iii) Approved plans for soil and water conservation	iii) Support <i>in situ</i> conservation of soil and water on terrestrial land	iii) Healthy ecosystem	Agriculture, CDA, KWS, KFS	15,000,000	5 years
		STRAT 3.2.3: Promote best practices and develop guidelines and standards for sea-bed mining and oil exploration	OUT 3.2.3: (i) Seabed plans available	i) Carry out sea bed mapping and zoning	i) Delineated sea-bed maps	KMFRI, Lands	80,000,000	2 years

			OUT 3.2.3: (ii) Biodiversity hot spots designated	ii) Designate critical hot-habitats/biodiversity spots/flagship areas	ii) Designated critical habitats/biodiversity hot-spots/flagship areas	KWS, KFS, NEMA, Planning	15,000,000	2 years
			OUT 3.2.3: (iii) Zoning plans for mining and oil exploration	iii) Designate oil exploration and sea-bed mining areas	iii) Oil/mining exploration maps	KMA, Mines and Geology, NOC	50,000,000	4 years
			OUT 3.2.3: (iv) Regional and international instruments domesticated	iv) Domesticate regional and international instruments on oil exploration and sea-bed mining	iv) National legislation on oil exploration and sea-bed mining	NOC	10,000,000	2 years
		STRAT 3.2.4: Strengthen local authorities to enforce by-laws regulating municipal waste management	OUT 3.2.4: (i) Established and functional reward scheme	i) Establish reward schemes for best practice	i) Healthy ecosystems	KWS, MOT, KFS, FiD, NEMA	3,000,000	2 years
			OUT 3.2.4: (ii) Effective monitoring and surveillance in place	ii) Strengthen the surveillance and monitoring of waste disposal within local authorities	ii) Healthy ecosystems	KWS, MOT, KFS, FiD, NEMA	10,000,000	5 years
			OUT 3.2.4: (iii) Functional PPP	iii) Forge private public sector partnerships to manage waste	iii) Private-public sector Participation	CDA, local authorities	5,000,000	5 years
		STRAT 3.2.5: Promote the implementation of the oil spill contingency plan	OUT 3.2.5: (i) OSMARG capacity strengthened	i) Strengthening capacity of OSMAG and other institutions to respond to Oil Spill incidents	i) Effective OSMAG	KMA, NEMA	3,000,000	2 years
			OUT 3.2.5: (ii) Compliance to Environmental Quality Standards	ii) Support the enforcement the polluter pays principle in relation to EMCA (water quality) regulation 2006	ii) Level of compliance	KMA, NEMA	4,000,000	5 years

			OUT 3.2.5: (iii) Valuation of key resources/habitats established	iii) Conduct resource valuation for ease of compensation from oil spill incidents	iii) Compensation manual	FiD, KWS, KFS	10,000,000	3 years
		STRAT 3.2.6: Promote the build up of knowledge base on the coral reef and seagrass ecosystems through scientific research and monitoring	OUT 3.2.6: (i) Data base established and functional	i) Establish database on the status of coral reefs and associated ecosystems	i) Database	KMFRI, KWS	4,000,000	2 years
			OUT 3.2.6: (iv) Print and media programs	iv) Create awareness on critical coastal marine habitats through print and electronic media	iv) Environmental citizenship	KWS, FD, CSO, NEMA	2,500,000	5 years
			OUT 3.2.6: (v) National celebrations held	v) Organize and hold celebrations to mark international days on coastal and marine environment	v) Report on events	KWS, NEMA, FD, KMFRI & stakeholders	5,000,000	5 years
			OUT 3.2.6: Increased regional cooperation	vi) Strengthening regional and International linkages including participation in symposia and conferences	Number of conference reports	NEMA, KWS, KMFRI	10,000,000	5 years
		STRAT 3.2.7: Promote the use of indigenous knowledge and scientific information in the exploitation and management of coral reef and seagrass resources	OUT 3.2.7: (i) Intellectual property rights at all levels established	i) Introduce intellectual property rights to safeguard scientific, indigenous and cultural knowledge	i) Patent rights	KIPI	1,500,000	5 years
			OUT 3.2.7: Information on indigenous knowledge	ii) Carry out survey of all relevant indigenous, cultural and scientific information for documentation and mainstreaming in outreach programs	ii) Database	NMK	1,500,000	3 years

			OUT 3.2.7: Resources centres established	iii) Establish centres of excellence on indigenous, cultural and scientific knowledge and technologies for showcasing	iii) Centres of excellence	NMK	20,000,000	2 years
		STRAT 3.2.8: Domesticate the United Nations Framework Convention on Climate Change, (UNFCCC), and related Multilateral Environmental Agreements (MEAs).	OUT 3.2.8: (ii) Number of international obligations domesticated	ii) Promote domestication of UNFCCC and related MEAs	ii) National Legislation	NEMA	2,000,000	1 year
				iii) Fast track the implementation of national wetlands policy through targeted roll out programs	iii) National wetland legislation contributing to ICZM	KWS, NEMA	1,000,000	
TA 3: Conservation of the Coastal and Marine Environment	SO 3.3: Preserve, Protect and Restore the integrity of Estuaries and Deltas	STRAT 3.3.1: Ensure good land use practices to manage erosion and minimize the high loads of suspended sediments and siltation	OUT 3.3.1.(i): River basin management plans developed in place	i) Develop and implement Integrated river basin management plans	i) Integrated river basin management Plans	WRMA, TARDA, NEMA	1,500,000	2 years
			OUT 3.3.1.(ii): Guidelines in place	ii) Develop guidelines on use of accreted lands on river banks, beaches e.g. Malindi	guideline on use of accreted land	WRMA, TARDA, NEMA	2,000,000	2 years
			OUT 3.3.1.(iv): strategic silt traps set up	iv) Set up strategic silt traps with regular maintenance along rivers	no of silt traps in place	MOA	1,000,000	2 years
TA 3: Conservation of the Coastal and Marine Environment	SO 3.3: Preserve, Protect and Restore the integrity of	STRAT 3.3.2: Promote integrated river delta planning and management	OUT 3.3.2.(i): water abstraction and diversion plan for rivers developed	i) Develop and implement water abstraction and diversion plan for rivers	River water abstraction and diversion plans	WRMA	3,000,000	2 years

	Estuaries and Deltas							
			OUT 3.3.2.(ii): Flood mitigation and management plan developed	ii) Develop a flood management and mitigation plan	Flood mitigation and management plan	WRMA	1,500,000	
			OUT 3.3.2.(iii): Early warning systems for floods response developed	iii) Mainstream early warning systems for floods response	no of early warning systems in place	WRMA, Met Dept	5,000,000	2 years
		STRAT 3.3.3: Declare deltas as conservation areas with zoning regimes to ensure protection of biodiversity in line with the Wildlife Conservation and Management Policy	OUT 3.3.3.(i): management plan developed and implemented	i) Develop and implement an Integrated management plan for the Tana Delta through participatory process	Tana Delta Integrated management plan	NEMA, KWS, WRMA, TARDA	1,000,000	2 years
			Site specific Integrated management Plans for estuaries developed and implemented	Develop and implement site specific Integrated management for Estuaries including Sabaki Estuary among others	Integrated management Plans for specific estuaries	NEMA in collaboration with relevant stakeholders	10,000,000	
			Vulnerability and land capability maps developed	ii) Map and zone the Tana Delta based on vulnerability and land capability map	zoning maps	Planning, WRMA, TARDA, KMFRI	1,000,000	3 years
		STRAT 3.3.4: Ensure enforcement of best practices in planning and implementation of river basin development for environmental sustainability	OUT 3.3.4: (i) Guidelines developed	i) Develop guidelines on best practices in planning and implementation of river basin development	Guidelines	TARDA	2,000,000	2 years

	SO 3.4: To improve the management of municipal wastewater and solid waste	STRAT 3.4.1: Strengthen local authorities to effectively manage urban waste	OUT 3.4.1: Strategic installation of solid waste receptors	i) Strategic installation of solid waste receptors with regular collection programs	Improved waste management	Municipal, water service board	6,000,000	5 years
			OUT 3.4.1: (ii) Solid waste dumping site in place	ii) Acquire, designate and develop landfill	no of landfills	Municipal, water service board	5,000,000	5 years
			OUT 3.4.1: (iii) Sewerage infrastructure in place and functional	iii) Expand and refurbish the sewerage infrastructure and connectivity	Number of sewerage infrastructure refurbished	Municipal, water service board, CDA	20,000,000	5 years
			OUT 3.4.1: (iv) solid waste dumping sites identified and designated	iv) Identify and designat solid waste dumping sites	Solid waste designated dumping sites	Municipal, NEMA	3,000,000	5 years
		STRAT 3.4.2: Promote public-private sector-partnership in waste management	OUT 3.4.2.(i): improved waste management	i) Establish solid waste sorting and collection programs based on PPPs	Number of successful partnerships	Local Govt, NEMA	5,000,000	
			Youth groups actively participating in solid waste management	ii) Encourage youth groups to participate in garbage collection and disposal	Number of Youth groups actively participating in solid waste management	CSO,	2,000,000	
			OUT 3.4.2.(iii): Pilot Waste recycling programmes developed	iii) Develop and encourage garbage recycling	Number of pilot Waste recycling programmes developed	CSO, Nema, municipal	4,000,000	
		STRAT 3.4.3: Promote public awareness on good waste management practices to ensure a clean and healthy environment	OUT 3.4.3.(i): public training and awareness programs implemented	i) Develop and implement public training and awareness programs	no. of training materials and curriculum	CSO,	1,500,000	

			OUT 3.4.3.(ii): Demonstration sites on best waste management practices developed	ii) Develop demonstration sites on best waste management practices	Number of demo sites	NEMA, Municipal	20,000,000	2 years
		STRAT 3.4.4: Enforce the EMCA (Waste Management) Regulations 2006	OUT 3.4.4.(i): solid waste management regulations enforced	i) Enforce solid waste management regulations	no of licenses, inspection reports, prosecution reports	NEMA, Municipal	2,500,000	5 years
			OUT 3.4.4.(ii): Reduced violations	ii) Strengthening surveillance and monitoring systems	surveillance records	NEMA, Municipal	4,000,0000	5 years
			OUT 3.4.4.(iii): public and private sector on EMCA regulations on waste management	iii) Train the public and private sector on EMCA regulations on waste management	Number of . trained public and private sector players	NEMA, Municipal	3,000,000	5 years
		STRAT 3.4.5: Promote the	OUT 3.4.5.(i): Pollution (solid wastes and effluent discharge) hot spots in the coastal zone mapped	i) Identify and map pollution (solid wastes and effluent discharge) hot spots	hot spot (solid wastes and effluent discharge) identified and mapped	Planning, KMFR	4,000,000	2 years
		STRAT 3.4.4: Enforce the EMCA (Waste Management) Regulations 2006	Coastal zone pollution prevention and control guidelines developed	Develop Coastal zone pollution prevention and control guidelines	Guidelines	NEMA	2000,00	
			OUT 3.4.5.(ii): Classification and zoning of sites based on pollution sources done	ii) Classification and zoning of sites based on pollution sources, levels, types and potential threats	sites classified and zoned	Planning, KMFR	5,000,000	2 years
			OUT 3.4.5.(iii): Pollution management and mitigation strategy	iii) Develop and implement pollution management and mitigation strategy	Pollution management and mitigation strategy	NEMA, Municipal	5,000,000	

			developed and implemented					
			OUT 3.4.5.(v): Capacity building programmes on pollution management and mitigation implemented	v) Capacity building and awareness raising on pollution management and mitigation	Number of training/awareness forums conducted	CSO, NEMA, KMA	3,000,000	5 years
	SO 3.5: To improve water quality	STRAT 3.5.1: Promote IWRM strategies to safeguard water quality	OUT 3.5.1.(i): Effluent discharge Standards reviewed and adopted	i) Review and adopt effluent discharge standards	Effluent discharge Standards Reviewed effluent discharge Standards	NEMA/KMA	2,000,000	1 year
			OUT 3.5.1: Best practice models for MWWM developed and implemented	ii) Develop and implement best practice models for MWWM	MWWM models in place	NEMA	5,000,000	2 years
				iii) Identify pilot areas for interventions: including collection, treatment and disposal of effluent	priority areas identified	Local authority, NEMA	2,000,000	2 years
			Training and awareness on appropriate MWWM systems and cleaner production technologies done	iv) Build capacity and create stakeholder awareness on appropriate MWWM systems and cleaner production technologies	Number of training and awareness meetings	Local authority, NEMA, water and sanitation companies, NGOs, CBOs	2,000,000	2 years
			OUT 3.5.1: MWWM systems improved	v) Identify appropriate MWWM systems and Improve/rehabilitate existing wastewater systems where necessary	Number of wastewater management systems improved	Municipal, coast water services	40,000,000	5 years

				vi) Construct appropriate wastewater management systems where they are lacking especially in urban centers	Number of constructed systems	Municipal and local authorities, water and sanitation companies, NGOs	25,000,000	5 years
			OUT 3.5.1: (improved compliance in waste water management	Set up water quality monitoring and compliance team	Water quality monitoring teams	Municipal, CWSB, NEMA, water and sanitation companies	10,000,000	5 years
			OUT 3.5.1: IWRM developed and implemented	viii) Develop and implement IWRM plan	IWRM plan	WRMA	10,000,000	5 years
		STRAT 3.5.2: Enforce EMCA (Water Quality) Regulations 2006	OUT 3.5.2: (i) Effective enforcement of municipal waste management by-laws	ix) Create awareness to Water quality regulations	strategies prepared	NEMA, CSOs and other stakeholders	3,000,000	1 year
			Regular inspections carried out	Carry out regular inspections to enforce Water Quality Regulations	Number of inspections	NEMA and Government lead institutions	5,000,000	5 years
		STRAT 3.5.3: Ensure sustainable extraction of groundwater to control the problem of saltwater intrusion into water aquifers	OUT 3.5.3.(i): assessment of available ground water resources in the coastal zone done	i) Carry out an assess of available ground water resources in the coastal zone	ground water resources data and assessment report	NEMA, WRMA	5,000,000	2 years
			OUT 3.5.3.(ii): Sustained water abstraction	ii) Carry out Pump testing and Set extractable quotas	number vistration and quotas determined	WRMA	2,000,000	2 years
			OUT 3.5.3.(iii): water harvesting pans established	iii) Establish water harvesting pans	number of pans established	WRMA, KWPC	10,000,000	5 years
				iv) Set up water monitoring and compliance team	teams set up	WRMA,	1,500,000	1 year

			OUT 3.5.3: (increased rain water harvesting	Sensitise public on rain water harvesting	number of sensitization meetings	WRMA	3,000,000	5 years
		STRAT 3.5.4: Promote public awareness on the importance of protecting natural water systems and development	OUT 3.5.4.(ii): enhanced public awareness	ii) Undertake public sensitization and awareness	number of sensitization meetings	WRMA	2,500,000	5 years
			OUT 3.5.4.(iii): enhanced public awareness	iii) Develop policy briefs and other materials	no of briefs developed	NEMA, WRMA	4,000,000	2 years
			OUT 3.5.4.(iv): increased water availability, reduced waterborne diseases	iv) Restoration of water catchment	Size of area restored	KWS, KFS, KEFRI, WRMA	20,000,000	5 years
			OUT 3.5.4.(i): enhanced capacity on water use	i) Capacity building on integrated water resource management through training	no of trainings/forums	KWS, KFS, KEFRI, WRMA	10,000,000	5 years
			OUT 3.6.1: (enhanced monitoring and compliance	ii) Set up joint monitoring and compliance team	monitoring and compliance team in place	WRMA	1,000,000	1 year
			OUT 3.6.1: waste water treatment plants established in urban centres	iv) Establish waste water treatment plants and promote waste water recycling in urban areas	no. of treatment plants established	Local Gov., CWSB, Municipal.	100,000,000	5 years
			OUT 3.6.2: (water extractable quotas set for different users	ii) Set water extraction quotas	water allocation plan	WRMA	2,000,000	2 years
			OUT 3.6.2: (improved access to water points	iv) Set up central collection points/kiosks	no. distribution kiosks	Municipal.	5,000,000	2 years

Thematic Area	Strategic Objective	Action Strategies	Expected output	Actions	Performance Indicator	Responsibility & Partners	COST	Duration
TA 4: Environmental Management and Risks	SO 4.1: To minimize the impacts of shoreline change	STRAT 4.1.1: Develop and implement a Shoreline Management Plan	OUT 4.1.1: assessment of extent and magnitude of shoreline change assessed	i) Conduct assessment of extent and magnitude of shoreline change and sediment budget	Vulnerability maps and reports	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	6,000,000	2 years
			OUT 4.1.1: (enhanced capacity to tackle shoreline change	ii) Document successes and failures of mitigation measures for the purpose of sharing and exchanging information on lessons learnt	defined setback requirements	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	2,000,000	2 years
			OUT 4.1.1: Shoreline restoration measures implemented	iii) Implement Shoreline restoration measures on selected areas as well as monitor the status of restored habitats	Number of successful shoreline restoration	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	30,000,000	5 years
			OUT 4.1.1: (documentation of vulnerable sites	iv) . Develop an awareness of existing expertise in the region	database of experts and institutions	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	5,000,000	2 years
			OUT 4.1.1: Enhanced capacity in shoreline restoration	v) Building and strengthen scientific and technical capacity for conducting shoreline assessment and monitoring, mitigation and restoration	training reports	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	10,000,000	2 years
			OUT 4.1.1: Enhanced regional and international collaboration	vi) Enhance regional and international collaboration and promote the exchange of staff transfer of technology necessary for addressing shoreline change in the region	Number and variety of collaborations	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	25,000,000	2 years
			OUT 4.1.1: Best practices in shoreline management	vii) Develop shorelines management tools and instruments, such as guidelines, highlighting best practices	best practice guides	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	3,000,000	2 years

		STRAT 4.1.2: Ensure that land use plans along the shoreline are informed by the Shoreline Management Plan and monitoring data	OUT 4.1.2: awareness among stakeholders	i) Create awareness among stakeholders to ensure that key concepts/aspects of shoreline change are understood	Informed public about shoreline change	CDA, KMFRI, Physical Planning Department & Coordinating body, NEMA	2,000,000	2 years
		STRAT 4.1.3: Harmonise, strengthen and enforce the regulations guiding development along the land/water interface	OUT 4.1.3: Existing shoreline development and management regulations reviewed	i) Review existing regulations on shoreline management and development	Reviewed shoreline development and management regulations	Physical Planning Department & Coordinating body, NEMA	1,500,000	2 years
	SO 4.2: To take into consideration the effects of climate change in the development process	STRAT 4.2.1: Develop a strategy for protection of the coastal area against the impacts of climate change	OUT 4.2.1: Sensitivity and vulnerability assessment done	i) Sensitivity and vulnerability assessment of the coastal area against the impacts of climate change	Buffer zones, Sensitivity and vulnerability assessment reports/maps	Physical Planning Department & Coordinating body	2,000,000	2 years
			OUT 4.2.1: Climate change mitigation/adaptation measures	ii) Develop and implement climate change mitigation/adaptation measures	Adaptation and increased resilience to climate change	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	3,000,000	5 years
			OUT 4.2.1: Degraded Habitats restored	iii) Implement restoration measures on selected areas as well as monitor the status of restored habitats as contribution to combat climate change	Pilot/demonstration projects, Monitoring reports	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	6,000,000	2 years
			OUT 4.2.2: (indicators for change developed and put into use	i) Identify and develop appropriate indicators for change	Scientific Reports/assessments	KMFRI, KEFRI, CDA & Coordinating body	3,000,000	5 years

			OUT 4.2.2: Information on climate change developed and disseminated	ii) Develop and dissemination of information on climate change indicators	Information on Effects of Climate change materials, Number of dissemination meetings	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	2,000,000	5 years
		STRAT 4.2.3: Develop early warning systems for natural disasters such as Tsunami and effects of sea-level rise and its effect and impact on vulnerable areas	OUT 4.2.3: Sensitivity and vulnerability assessment done	i) Sensitivity and vulnerability assessment of the coastal area against sea level rise	Scientific reports, Periodic bulletin	KMFRI, KMD & Coordinating body	5,000,000	5 years
			OUT 4.2.3: (Improved management of disasters/enhanced response to disasters	iii) Prepare and implement Disaster Response Plans	DRP plans	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	2,000,000	2 years
			OUT 4.2.3: (Informed public	iv) Dissemination of appropriate information on disaster response and management	Information on Effects of Climate materials	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	2,000,000	2 years
		STRAT 4.2.4: Promote sharing and dissemination of knowledge and technology in the response to climate change	OUT 4.2.4: (Regular bulletin through various public media	i) Compile and dissemination of appropriate information on climate change indicators	Number of information dissemination documents (Bulletin, newsletter etc)	KMFRI, KMD & Coordinating body	4,000,000	5 years
			OUT 4.2.4: (Effective communication of CC	ii) Establish a clearing house mechanism for climate change information on coastal and marine areas	CH established	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	5,000,000	2 years
			OUT 4.2.5: extent and magnitude of climate change in	i) Conduct assessment of the extent and magnitude of climate change	Assessment reports	CDA, KMFRI, Physical Planning Department & Coordinating body	5,000,000	

			the coastal zone established					
			OUT 4.2.5: (Improved information sharing and response to climate change	ii) Document successes and failures of mitigation measures for the purpose of sharing and exchanging information on lessons learnt	Case studies reports	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	5,000,000	5 years
			OUT 4.2.5: Roster of experts on climate change compiled	iv) Set-up a roster of experts, institutions and interested partners within and outside the region dealing with climate change	Experts and institutions Directory	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	1,000,000	1 year
			OUT 4.2.5: (Improved capacity to address CC	vi) Building and strengthen scientific and technical capacity for conducting climate change assessment and monitoring, mitigation and restoration	Number of Trainings at all levels (certificate, diploma, exchange programs etc)	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	3,000,000	5 years
			OUT 4.2.5: regional and international partnerships to address CC developed	vii) Enhance regional and international collaboration and promote the exchange of staff transfer of technology necessary for addressing climate change in the region.	Number of partnerships and domesticated MEA's and staff exchanges	CDA, KMFRI, Physical Planning Department, Local Authority & Coordinating body	6,000,000	5 years

Thematic Area	Strategic Objective	Action Strategies	Expected output	Actions	Performance Indicator	Responsibility & Partners	COST	Duration
TA 5: Capacity Building, Education, Awareness and Research	SO 5.1: Education, Awareness and Information Programs Focusing on Coastal Zone Management	STRAT 5.1.1: Develop, and implement an ICZM education and awareness strategy	OUT 5.1.1: (i) Needs assessment report with identified target groups	i) Conduct ICZM capacity needs assessment and identification of target groups	i) Report	CDA, Ministry of Education, KMFRI, KEFRI, KWS, Ministry of Fisheries, Coordinating body	5,000,000	1 yr

			OUT 5.1.1: (ii) Training manuals and IEC materials developed	ii) Develop ICZM training manuals and other education and communication materials for the different target groups	ii) Training manuals and IEC materials	CDA, Ministry of Education, KMFRI, KEFRI, KWS, Ministry of Fisheries, Coordinating body	10,000,000	2 yrs
			OUT 5.1.1: (iii) Trainings/awareness sessions held for different target groups	iii) Conduct training and awareness on ICZM targeting different groups	iii) Workshop	CDA, Ministry of Education, KMFRI, KEFRI, KWS, Ministry of Fisheries, Coordinating body	32,000,000	4 yrs
			Networking and lesson sharing Forum established	Establish a Forum for networking and lesson sharing between practitioners, academia and policy makers	Active Forum sharing information of coastal zone management	NEMA, lead government institutions, ACADEMIA, Research Institutions, NGOs, CBOs	5,000,000	5 years
			Environmental education centres established	Establish environmental education centers especially near coastal zone urban setting	Environmental education centres	Ministry of education, Academia, Research Institutions, NGOs, CBOs, NEMA, KWS		5 years
			Coastal zone management promoted as a topic for study in learning institutions	Promote coastal zone management as a topic for study and career development in learning institutions to ensure future capacity	Curricular on Coastal zone management in learning institutions	Ministry of education, Academia, Research Institutions, NGOs, NEMA, KWS		5 years
		STRAT 5.1.2: Mainstream ICZM education with the Education for Sustainable Development (ESD) policy	OUT 5.1.2: (i) Gaps on ICZM identified in the ESD	i) Identify gaps on ICZM related issues in the Education for Sustainable Development Strategy (ESD)	Report	NEMA, Ministry of Education, Ministry of planning, NSAs	2,000,000	5 yrs
			OUT 5.1.2: (ii) ICZM incorporated in ESD	ii) Revise ESD to incorporate ICZM issues	Revised ESD policy document	NEMA, Ministry of Education, Ministry of planning, NSAs	50,000,000	5 yrs
			OUT 5.1.2: (ii) ESD adapted in ICZM	iii) Adapt ESD in ICZM	ESD adapted in ICZM	NEMA, Ministry of Education, Ministry of planning, NSAs	100,000,000	5 yrs

		STRAT 5.1.3: Mainstream traditional knowledge and practice in the conservation, planning and management of coastal resources	OUT 5.1.3: (i) Researched information on traditional knowledge and practice	iii) Promote research in traditional knowledge and practice in the conservation, planning and management of coastal resources	Publications and reports		10,000,000	4 yrs
		STRAT 5.1.4: Promote the integration of environmental best practices into the activities of government, developers, communities and other stakeholders	OUT 5.1.4: (i) Best environmental practices identified and documented	i) Identify and document environmental best practices	Best practices and incentives manual	NEMA	1,000,000	6 months
			OUT 5.1.5: (ii) incentives and awards for best environmental practices developed and implemented	ii) and develop and implement mechanisms such as incentives and awards schemes for best environmental practices	Incentives and environmental award schemes			3 yrs
			OUT 5.1.5: (iii) Best practices adopted	iii) Promote the adoption of identified best practices in the coastal region through education and awareness	Monitoring report		3,000,000	5 yrs
		STRAT 5.2.1: Promote the coordinated generation and dissemination of data and information, for use in planning and decision making	OUT 5.2.1: (iii) ICZM IMS developed and updated regularly	iii) Develop ICZM Information management system (ICZM IMS) and update it on regular basis	ICZM IMS		3,000,000	3 yrs

		STRAT 5.2.1: Promote the coordinated generation and dissemination of data and information, for use in planning and decision making	OUT 5.2.1: (iv) Coast GIS station developed and maintained regularly	i) Develop and maintain Coast GIS to support of ICZM activities	Coast Station	GIS	NEMA, CDA, KMFRI, DRSRS, Physical Planning Department & NEMA	10,000,000	5 yrs
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Thematic Area	Strategic Objective	Action Strategies	Expected output	Actions	Performance Indicator	Responsibility & Partners	COST	Duration
TA 6: Institutional arrangements and Legal Frameworks for ICZM	SO 6.1: Put in place legal and institutional frameworks for ICZM	STRAT 6.1.1: Review and harmonise policy and legislation on integrated coastal zone planning and management;	OUT 6.1.1: (Harmonized policies and legislations with respect to coastal zone management	i) Harmonise sectoral laws relevant for the coastal zone to avoid sectoral management conflicts and policy overlaps	Harmonised coastal management policies and legislations	Ministry of Environment and Mineral Resources, NEMA, and other state and non-state stakeholders	25,000,000	5 yrs
			OUT 6.1.1: Integrated Coastal zone Management Legislation developed	ii) Enact Integrated Coastal zone Management Legislation	ICZM Legislation	Ministry of Environment and Mineral Resources, NEMA, and other state and non-state stakeholders	15,000,000	3 yrs

Thematic Area	Strategic Objective	Action Strategies	Expected output	Actions	Performance Indicator	Responsibility & Partners	COST	Duration
TA 7: Implementation of ICZM action plan	SO 7.1: Mainstream and support implementation of the ICZM policy and action plan	STRAT 7.1.1: Mainstream and support implementation of the ICZM action plan	OUT 7.1.1: ICZM activities mainstreamed activities into plans, performance contracts and programmes by	i) Sensitize state and non-state actors to mainstream ICZM activities into work plans, performance contracts and programmes	sensitization workshops reports	All ICZM stakeholders	10,000,000	5 yrs

			state and non-state actors					
			OUT 7.1.1: (ICZM Action Plan funding mechanism developed and implemented	ii) Develop and implement funding mechanism for the ICZM action Plan	Funding mechanism including bankable proposals	All ICZM stakeholders	30,000,000	5 yrs
			ICZM Steering Committee legalized and Strengthened	Legalize and strengthen the ICZM Steering Committee to assist NEMA in overseeing implementation of the ICZM Action Plan	Effective ICZM Steering Committee	NEMA, MEMR	2,000,000	
			DECs and PECs strengthened to assist in implementation of the ICZM Action Plan	Strengthen the DECs and PECs to assist in implementation of the ICZM Action Plan	Effective DECs and PECs			
			OUT 7.1.1: (Monitoring and evaluation reports	v) Monitor and evaluate implementation of the ICZM Action Plan	Reports	NEMA, All ICZM stakeholders	15,000,000	5 yrs
			OUT 7.1.1: (Capacity of institutions and personnel built to implement ICZM Action Plan	vi) Build capacity for institutions and personnel to implement ICZM Action plan activities	Institutions and personnel involved in Action Plan implementation	All ICZM stakeholders	100,000,000	