COASTAL LIVELIHOODS IN THE REPUBLIC OF KENYA

GENERAL INTRODUCTION

The Agulhas and Somali Current Large Marine Ecosystems (ASCLME) project is focused on the two large marine ecosystems of the Western Indian Ocean (WIO) region, covering nine countries that are directly influenced by these current systems. It is estimated that at least fifty-six million people are reliant either directly or indirectly on the goods and services provided by these two current systems. The ASCLME project aims to support these countries in their efforts to collectively manage the marine resources on which their people and economies depend. Fisheries and other key coastal activities, including various forms of tourism, aquaculture, shipping and coastal transport, the energy sector, agriculture and forestry, are very important contributors to the economies of the countries of the WIO. In recognition of the complexity and importance of these activities, a Coastal Livelihoods Assessment (CLA) component was developed for the ASCLME project.

The CLA component had three main objectives:

- to collect as much existing information as possible about the main coastal activities in the nine participating countries as a contribution to the national Marine Ecosystem Diagnostic Analyses (MEDAs);
- to make input into ensuring that this information is stored and organised in a manner that will allow easy access and maximum utility to multiple stakeholders, both during and after the lifetime of the ASCLME Project;
- to review and sythesise the information collected in order to provide useful inputs to the TDA and SAP processes.

In order to achieve these objectives, the CLA component was separated into three distinct phases, with the first phase kicking off in May 2009. During phase one, a "desktop" review of available data was conducted by the regional project coordinators, input was made into the design of a literature management tool to facilitate the storage of information, and preparations were made for the in-country data gathering process. Planning meetings were held between the core CLA team and the in-country Data and Information (D+I) Coordinators in August 2009. The processes involved in the in-country component of recruitment and data gathering was discussed and confirmed at this stage.

Phase two involved in-country personnel having been identified and recruited through a regionally inclusive recruitment process. Nominations were invited and received from country focal points and D+I Coordinators. Twenty three consultants were recruited to assist with the project. For some sectors international experts (drawn from the region where possible) were asked to provide information for all countries in the region while in others, where good local capacity existed, in-country consultants were recruited. This group of consultants collected information from existing resources, such as published articles, government reports, regional reviews, project reports and outputs, policy documents as well as a range of other grey literature that was likely to be useful.

Phase three involved the organisation of the information into country Coastal Livelihood Reports where individual sector reports have been assessed and the key elements from each sector extracted and presented in a summarised format. These country reports will be reviewed by project representatives in each country and once accepted, will be incorporated as a separate Coastal Livelihoods chapter in the overall country MEDA documents. It is anticipated that the information collated in these reports will allow examples of best-practice to be identified for application in other parts of the region. The objective

is to build on approaches that work rather than to duplicate efforts. Information gaps will be identified and addressed in subsequent phases of the ASCLME, including during a Cost/Benefit Analysis (CBA) exercise designed to weigh up the costs and benefits of various development options. Key information from these reports will feed into the CBA and hopefully provide useful guidelines for the Transboundary Diagnostic Analysis (TDA) and the development of Strategic Action Plans (SAP) for the overall ASCLME project.

The following country report begins with an overview of coastal livelihoods in Kenya, which provides a concise overview of the seven sector reports and the findings of the in-country and regional consultants. This overview ends with a conclusion which summarizes the collected information as it relates to the coastal zone in Kenya in general. This overview is followed by the more detailed sector reports, which represent the original contributions by the in-country and regional consultants. The sectors are organized in the following order: Small-scale Fisheries, Tourism, Mariculture, Agriculture and Forestry, Energy, Ports and Coastal Transport and Coastal Mining.

Each sector report has been prepared by specialists in that particular sector drawn either from the country or internationally. Sector reports have been prepared according to a pre-determined template to ensure that the relevant aspects of that sector were captured by the consultants. Reports include descriptive sections on the biophysical environment, human environment, policy and governance, planning and management, and development, trade and projects related to that sector. Each report is concluded with a SWOT analysis which provides a summary of the Strengths, Weaknesses, Opportunities and Threats facing that sector. It is the outputs of these SWOT analyses that are of particular importance to the strategic planning aspects of the overall ASCLME project. These reports were initially submitted to the regional coordinators for review and have subsequently been corrected and updated by the consultants themselves.

Finally, each sector report has a bibliography containing key references and links to relevant information. Full details of the information resources collected during compilation of each sector report, as well as electronic copies of literature (where available), are included in the overall ASCLME reference management system.

OVERVIEW OF COASTAL LIVELIHOODS IN KENYA

I. Small-Scale Fisheries

The small-scale fisheries in Kenya, defined as artisanal in the country report, employs 10,000 people and supply's 95% of the country's total marine catch, generating an estimated US$ 3.2 million per year and accounting for between 2% and 6% of total fish production in the country. An estimated 60,000 coastal residents depend on the sector, wherein, the level of dependence is higher in regions with low development, less salaried employment and high poverty rates. Hence, while the entire fisheries sector only contributes 0.5% to national GDP, it is nevertheless a vital component to economic activity in the coastal regions.

Population growth, along with high levels of poverty in the coastal regions, has contributed to increases in the number small-scale fishers, with a 34% increase documented between 2004 and 2008. This has, in turn, placed great strain on fish stocks along the coast, resulting in the over-exploitation of fisheries resources. This has subsequently resulted in an overall decline in small-scale landings, evident in the 50% decrease in demersal coral reef fish yields through the 1990's. Rabbit fish and scavengers, which make up nearly 40% of the small-scale fishers' landings, also declined by 40% in the 1990's, while the catch of tuna has been declining since 2004. Destructive fishing techniques, such as trawling, as well as the use of

seine nets and spear guns, have also facilitated these declines, however, population growth and poverty in the coastal regions have been documented as the key attributing factors.

As a whole, despite weaknesses in governance, training, data and planning, there are positives in the sector. For example, investments in processing by the private sector have opened up opportunities for small-scale fishers to venture into non-traditional fishing grounds and strengthen value chain links. Likewise, a local bank has developed a loan program for the sector, which should allow fishers to upgrade equipment. The government's Oceans and Fisheries policy, along with its new co-management programs, have also empowered coastal fishers, promoted sustainable practices and improved compliance in licensing requirements in coastal communities. Increased competition from recreational fishers and prawn trawlers, as well as a lack of capacity at the local level, does, however, highlight the challenges still confronting the sector. In addition, this study was not able to find any data on small-scale enterprises that are complementary to the fishing industry such as boat repairs. This is an information gap that needs to be addressed.

II. Tourism

Tourism contributes 5% to total GDP, however, when considering all linkages within the sector, it is estimated that tourism contributes upwards of 11.6%, which would make it the country's third-largest contributor to GDP. The sector makes up 4% of total employment in the country, providing nearly 483,000 jobs in 2008, and contributes 18% to total foreign exchange earnings, between 52% and 68% of which is derived from coastal tourism activity. The sector has also been strong in recent years, with arrivals increasing from 814,000 in 1990 to over 2 million in 2007 and revenue increasing from Kshs56.2 billion to Kshs65.4 billion between 2006 and 2007, representing an 11.6% growth rate. However, like most countries, 2008 saw sharp declines in revenue, with earnings decreasing by 16.2%. Comparatively, the sector is nevertheless quite dominant in the African continent, receiving 6% of all international tourist arrivals to Africa.

There are several difficult challenges in the sector, despite the relative success noted above. For example, due to extensive leakages in the sector, it estimated that only between 2% and 5% of tourism receipts actually trickle down to local communities. Similarly, a lack of sector data, national planning, air access and seat capacity all highlight the weaknesses prevalent in the sector, while regional competition, mass market branding and malaria have all been identified as challenges. Likewise, deteriorating infrastructure, extensive visa restrictions and anti-competitive trade practices continue to constrict growth in the sector, while terrorism, corruption, negative travel advisories and price pressures have all been highlighted as prevalent threats to development. Human-wildlife conflicts, as well as animal poaching, have also been identified as threats. There are, however, inherent social and environment strengths that give the country a comparative advantage. For example, endemic coastal forests, marine parks, and wildlife sanctuaries are clearly intriguing to international tourists', while the country's ecological and topographic diversity, as well as its excellent climate, could be very beneficial in marketing the sector. The country's unique cultures and diverse heritages and traditions are also a great tool through which to increase sector activity and potentially integrate local communities into the sector.

There are also many opportunities in the sector that could be utilized to mitigate some of the aforementioned constraints. For example, Vision 2030, along with the Poverty Reduction Strategy Program, both highlight the government's commitment to utilizing the tourism sector as a means of enhancing local employment opportunities. Parastatals, such as the Tourism Trust Fund, are also being utilized to fund entrepreneurs to develop community eco-tourism projects, with successes being documented in the facility upgrades for the Mombasa Boat Operators, as well as improved marketing at the Malindi curio market. Improvements in the Kenya Wildlife Service, as well as the potential for local

development around protected areas, such as the Kisite Marine Park and Arabuko butterfly projects, have also been identified as strengths in the sector moving forward. Greater economic cooperation in East Africa also has the potential to have a positive impact on tourist activity. Thus, if potential shortages in investment capital are not overly detrimental in the future, and standards of quality can be improved, tourism has the potential to bring greater benefits to coastal communities in the future, particularly with the present government support.

III. Mariculture

There are several mariculture activities currently in the experimental stage along the south coast of Kenya. This includes eight finfish farms, six crab farms and four prawn farms, all of which are currently producing for domestic consumption. This development is a reflection of not only the high-quality seawater in the coastal region, but also the enthusiasm of coastal communities to develop mariculture activities. Many mariculture operations, particularly crab and finfish, are also being developed as community-based initiatives, again a testament to the willingness of coastal residents to become involved in the sector. Thus, despite inadequate coordination and planning in the sector, mariculture is a developing field in the Kenyan economy.

Challenges such as theft, conflict with other coastal users and poor training are constricting the farming of crab, while a lack of financial support, poor pond quality and the seasonal availability of fingerlings continues to hinder the successful farming of finfish. Issues of land tenure are also constraining the development of community-based initiatives in prawn farming, and suitable conflict-free culture space is limited for the development of seaweed farming. Environmental issues have also been reported, with the destruction of mangrove habitats being witnessed in prawn farming, while crablets are being harvested from the wild with little regard for resource status. Environmental concerns are, however, minimal in finfish farming.

Despite these constraints, there are many positive aspects associated with the sector. For example, NGO's, donors and the private-sector are involved in various projects that provide technological support and training to communities. Likewise, both the fisheries and forestry departments have shown a willingness to support the sector, and a development mandate has been produced by the coastal development authority. Similarly, there are also numerous candidate species, suitable for both small and large-scale operations, that hold great potential for future development. The privatisation of coastal state land, as well as hotel development, could, however, pose a threat to growth in the future.

IV. Agriculture and Forestry

Employing 70% of the total work force, supplying 70% of raw materials for domestic agro-industry and making up 80% of total export earnings and 45% of government revenue, agriculture and forestry is clearly the most dominant sector in the Kenyan economy. Agricultural activity in the coastal zone is also significant, producing food and non-food products for both subsistence and commerce, with cashews, bixa, sisal, as well as fruits and vegetables, all being produced for export.

As an estimated 62% of coastal residents live below the poverty line, the over-exploitation of natural resources has inevitably become a problem. Depletion of coastal and mangrove forests, as well as the destruction of sea grass beds, threaten vital ecosystems which, in the long run, will worsen poverty levels along the coast. This cycle of over-exploitation has also been attributed to population growth, urban migration and inadequate property rights, all of which place even further strain on the country's coastal resources. There is, however, wide recognition of the importance of the sector for coastal livelihoods, particularly evident with the government's Integrated Coastal Zone Policy, as well the creation of a

coastal unit within the National Environment Management Authority, both of which are promoting the protection of coastal resources and the empowerment of local communities. Similarly, the government's Integrated Coastal Zone Management scheme has placed emphasis the provision of alternative income generating activities, which could potentially reduce over-exploitation in the sector.

Overall, while a lack of capacity is threatening policy implementation, opportunities for sustainable growth in the sector are apparent. For example, both the World Bank and UNEP-GEF have shown interest in financing projects and activities that are not dependent on the utilization of coastal resources, while the prevalence of marginal agricultural lands in the coastal zone highlights opportunities for livestock production in areas where land is currently not fully utilised. Likewise, the Integrated Coastal Zone Policy has highlighted the willingness of the government to strengthen community capacity and potentially institutionalize participatory resource management in coastal areas. Thus, if political turmoil, corruption and population pressure can be reduced, sustainable growth in the sector is certainly possible.

V. Energy

There is no data currently available on the contribution of oil and gas to GDP, however, the country does have an downstream oil industry, along with East Africa's only refinery producing 1.6 million tonnes annually in Mombasa. The refinery is owned and operated by Kenya Petroleum Refineries Limited, whereby, the government of Kenya owns a 50% stake in the company, supplying Uganda, Rwanda, Burundi, Eastern DRC and Southern Sudan, as well as the domestic market. While regulations on crude imports and exports have gradually been lifted since 1994, the government is still firmly entrenched in transportation, storage and retail in the sector. The National Oil Company of Kenya has, however, made 17 blocks available for petroleum rights negotiations, while all offshore exploration is currently being undertaken by the private-sector. To date, biofuel development remains in its early stages and there is no firm evidence of offshore exploitable petroleum or gas reserves.

A number of constraints have been identified in the sector, perhaps contributing to the nominal level of activity. For example, a lack of handling capacity at the Mombasa port continues to limit the amount of oil imported, while the refinery currently produces 1.6 million tonnes below its actual installed capacity of 3.2 million tonnes. Competition for the best productive land between biofuels investors and other agricultural sub-sectors, as well as the failure to prioritize oil and gas in Vision 2030, have also been highlighted as weaknesses in the energy sector. Increases in oil exploration and production could also increase the likelihood of spills along the coast, which, in conjunction with poor environmental management from emerging market companies, could potentially be detrimental to coastal ecosystems in the future.

Several strengths and opportunities have, however, been identified in the sector. For example, any increased activity is likely to provide employment opportunities for adjacent communities, particularly in the downstream sector. The government has also shown a commitment to further oil exploration, while there are also prospects for future oil and gas activities at the Kisimu and Lamu ports, both of which are located in the coastal zone. A high concentration of gas has also recently been discovered by a Chinese company in Northern Kenya, with an oil discovery expected in the same area. Kenya Petroleum Refineries Limited has also shown a commitment to development at the community level, evident in its support for community level services . Thus, while activity in oil, gas and biofuels is currently not significant to the county's economy, there is potential for further growth in the sector, which could be highly beneficial for coastal communities if managed and regulated properly.

VI. Ports and Coastal Transport

Kenya has five ports, the main ones being Mombasa in the south, and Malindi and Lamu in the north, while smaller fishing ports exist at Kilifi and Shimoni. All the ports are administered by the Kenya Port Authority and governed by the Ministry of Transport, however, the private-sector has become increasingly involved, with the Japan Bank for International Cooperation funding a new container terminal in Mombasa, while upgrades in the Lamu corridor has attracted interest from investors from around the world.

The port in Mombasa, which is the country's only international port, has recently undergone numerous reforms. A new Vessel Tracking Management System, Global Maritime Distress Signalling System, as well as new safety regulations and a shift to 24-hour services, have all increased efficiency at the port, resulting in increases of 2.8% in throughput and 10.8% in transit, occurring between 2007 and 2008 respectively. Likewise, potential development of the Lamu corridor, including a new deepwater port and terminal for mining exports, could potentially not only produce similar increases, but it could also open up the interior for further development. Planned improvements to the Northern Development Corridor are also expected to create opportunities for development in coastal communities. Development of the Central Corridor in Tanzania could, however, provide competition.

As a whole, a weak manufacturing sector, poor training, and political instability in its neighboring countries highlight the constraints that still remain in the sector. Likewise, despite improvements in efficiency, the public sector still remains firmly entrenched in the sector. However, the strategic location of the country's ports, as well as its strong agriculture sector, does highlight the strengths prevalent in the sector moving forward. While corruption and a lack of development capital could become problematic, growth in the sector, as evident in the Mombasa port, is still very much a reality.

VII. Coastal Mining

Mining accounted for only 0.5% of total GDP in 2008, with mineral exports making up between 2% and 3% of total exports, employing an estimated 50,000 people. There are deposits of gold, gemstone fluorspar and soda ash throughout the country, however, mining activity in the coastal zone is largely focused on cement for local construction, with production concentrated in coral limestone, shale, and sand. The three largest cement mines are located in Mombassa, while informal mining is prevalent in the Kilifi and Kwale districts. There are also plans for a heavy sands mine in Kwale, with production expected to begin in 2013.

A clear strength of mining activity in the coastal zone, other than providing full-time employment for over 1,000 people, is the community development being promoted by the two largest active companies, Bamburi Cement Ltd. and Athi River Mining Ltd. Bamburi, for example, has invested in a school refurbishment program as a part of its community education support program, which includes the development of schools in disadvantaged communities in Mombassa. Athi River Mining Ltd. has also been active in the community, particularly in the Mavoko Municipal area, by constructing roads, donating food and clothing, as well as building dormitories for female children. Both companies also contribute taxes and royalties to the government, which has the potential to be invested in social services for coastal communities.

Overall, coastal mining is clearly not a dominant sector along Kenya's coast, however, the environmental issues around the sector, particularly erosion from sand and coral mining, could become problematic in the future if not attended to.. These issues are also accentuated by a lack of legislation for sand and coral mining specifically. Nevertheless, environmental regulation has been identified as a strength in the

country, while the Integrated Coastal Zone Management program is nearly ready for implementation, which should facilitate the sustainable use of coastal resources in the coming years. Likewise, the World Bank has funded a coastal development project to promote the sustainable use of coastal resources, which should also be effective in limiting the over-exploitation of coral and sand. Hence, the potential for the heavy sands mining in Kwale, along with a commitment to community development from active companies, should allow the sector to grow sustainably and simultaneously benefit local communities through employment and civic development.

Conclusion

Each sector covered in this report has had, and will continue to have, a distinct impact on the socioeconomic and environmental status of the coastal communities concerned. There are many constraints that remain constant across sectors, such as a lack of planning and management and the over-exploitation of natural resources, both of which have had a widespread impact on all of the sector's considered in the coastal livelihoods study. Planning, management and training are clearly constraining developments in the seven sectors. For example, inadequate planning and training in specific types of fishing has been identified as a weakness in the small-scale fishery. Similarly, poor training has been identified as a constriction on the development in the mariculture sector, while uncoordinated management and a lack of training at the community level has affected the conservation of mangrove forests in the agriculture and forestry sector. The same challenge can be seen in the ports and coastal transport sector, where a lack of training institutions and skills deficiencies have been documented as a threat to further development. Progress has, however, been seen in addressing these weaknesses. For example, the Fisheries Department is currently being reorganized to develop a more effective and efficient institutional framework capable of overseeing the sector, whereas, NGO's and donors are currently providing technical support and training to communities in the mariculture sector. Likewise, the government is currently promoting participatory resource management in the agriculture and forestry sector, which is positive from a planning and management perspective moving forward.

Environmental degradation and over-exploitation of natural resources are also challenges to Kenya's coastal communities. In the small-scale fishery, the use of destructive fishing techniques, poverty and population growth all continue to strain resources on the coast. In mariculture, the destruction of mangroves to make way for prawn farming, as well as the potentially harmful use of wild caught crablets, highlights the unsustainable practices currently taking place in the sector. Similar practices have been documented in agriculture and forestry, where poverty and over-exploitation are both seen as key variables facilitating the depletion of coastal and mangrove forests. However, methods of mitigating this exploitation, such as the development of substitutes and subsequently the creation of alternative income streams, are currently being implemented. This is most prevalent in agriculture and forestry, wherein, the World Bank is financing projects that seek to create employment in alternative sectors such as renewable energy, beekeeping and ecotourism. Mariculture itself is also a sector that could potentially attract labor away from sectors that are otherwise contributing to the over-exploitation of resources. The important point, in all cases, is that there is a direct link between poverty and natural resource exploitation, thus, creating alternative forms of employment should be a priority in the sectors where environmental strain is predominant.

Potential opportunities across sectors, particularly within the private-sector, could also be utilized as a means to spur alternative forms of employment across sectors. This is most prevalent in ports and coastal transport, where private-sector investments at the ports in Mombasa and Lamu have been very positive in improving efficiency. Such investment is also expected to be key in the development of both the Lamu corridor and the Northern corridor, which is expected to have potential spillovers in the respective coastal communities located nearby. In agriculture and forestry, there is an opportunity to utilize marginal lands

for livestock production, while private-sector investment in processing could potentially open up new markets for the small-scale fishery. Likewise, the prevalence of numerous candidate species highlights the opportunities in mariculture, which again could potentially create employment and subsequently shift labor away from more exploitive occupations. The government has also shown a commitment to oil exploration, which, if fruitful, also has the potential to create employment, particularly in the downstream sector.

Overall, there are clearly many strengths and opportunities that can be utilized to spur sustainable growth and development in Kenya's coastal region. Many of these opportunities also have the potential to generate alternative forms of employment, which, as alluded to above, could potentially lessen the strain being placed on coastal ecosystems. Creating alternative streams of income could, in turn, be conducive to sector spillovers, which could counter the cyclical relationship documented between poverty and natural resource exploitation. It is also positive to note that the Kenyan government has not only recognized the causal links between poverty and resources, but it has begun generating policies that intend to deal with the problem. The emphasis being placed on training, management, alternative employment and the sustainable use of resources all highlight the positive commitment the government is making in relation to the coastal region. Thus, while challenges still remain abundant, opportunities and a commitment to act are clearly present.

DETAILED SECTOR REPORTS

I. Small-Scale Fisheries – Prepared by Mr. Jacob Ochiewo,

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1. Introduction

Traditionally, the Kenyan coastal communities have depended on fisheries and mangrove exploitation for livelihood and income. Kenya is endowed with a rich inshore marine fishery with the most productive fishing areas being the North Kenya Banks which covers Lamu, Kiunga, Kizingitini and Faza, Malindi-Ungwana Bay that covers the Sabaki estuary and Tana River delta, and the Funzi-Vanga complex in the south coast (Ruwa *et al*., 2003)[1]. The marine fishery production in Kenya contributes 2% - 6 % of the total national fish production (FAO[2], 2007; Republic of Kenya[3], 2008). In the past decade, marine fish landings ranged between 5,000 tonnes and 8,000 tonnes per year (Republic of Kenya[4], 2005). The potential total yield of Kenyan marine waters has been estimated by Kenya's Ministry of Fisheries Development to be 150,000 tonnes (Republic of Kenya[3], 2008). It is expected that the South West Indian Ocean Fisheries Project (SWIOFP) will provide a more realistic estimate of the potential within Kenya's EEZ. As a whole, the fisheries sector currently contributes about 0.5% to Kenya's GDP (Republic of Kenya[3], 2008).

The inshore fishery is exploited by small-scale fishers, officially referred to as artisanal fishers, who use simple fishing crafts/vessels and gears. The most commonly used fishing gears include gillnet, shark nets, hook and line, beach seine, spear gun and traditional traps especially the basket traps (McClanahan *et al*.[5], 2005; McClanahan & Mangi[6], 2004; Ochiewo[7], 2004). The small-scale (artisanal) fishing in the inshore waters is labour-intensive providing employment and livelihood to thousands of households. Over 10,000 fishers are directly engaged in small-scale (artisanal) fishing in the Kenyan coast (Ochiewo[7], 2004; Fisheries Department[8,9], 2007; 2009). The artisanal fishers land at least 95% of the marine catch and over 60,000 coastal people depend on these fisheries (UNEP[10], 2006). Fishing effort has increased with increase in the number of small-scale fishers over the years. Increase in the number of small-scale fishers has been caused by rapid population growth at the coast and lack of employment opportunities for the young school leavers.

In 2006 the Kenyan marine fishery had 2,368 fishing boats, of which only 194 were motorized. In 2008 the number of fishing boats increased to 2,687 out of which only 319 were motorized (Fisheries Department[9], 2009). A total of 47 long liners and 32 purse seiners were licensed to fish in Kenya's EEZ in 2005 (Fisheries Department[11], 2005). Sharks are an important resource and a popular fish in Mombasa. Attention is being focussed on developing a Kenyan Plan of Action for sharks (IOTC[12], 2008). The small-scale (artisanal) fisheries of Kenya are multi-species in nature (WIOFish[13], 2008), landing over 95% of the marine catch and estimated to generate over US$ 3.2 million per year, (UNEP[10], 2006). Outriggers, canoes, planked boats and fibre boats are used to fish with gill-nets, hand-lines and tangle-nets. Using gillnets, handline and longlines, these fishers operate up to 10 nm miles during calm-sea periods. The artisanal tuna catch peaked in 2004, but has declined since then (IOTC[12], 2008).

After decades of growth, the Kenyan reef fishery now shows signs of over-exploitation (Ochiewo[7], 2004) with yields from the lagoonal reef fisheries declining (McClanahan & Mangi[14], 2001). The decline in yield has been attributed to increase in fishing effort and competition for dwindling fish stocks in the inshore waters (Glaesel[15], 2000; McClanahan *et al.*[16], 1997, McClanahan & Mangi[6], 2004). It has also been observed that the application of destructive fishing techniques within the inshore waters have also contributed to this negative change as some fishing methods introduced in the past few decades, such as

trawling, use of seine nets and spear guns are disapproved by traditional fisheries elders (McClanahan *et al*[16]., 1997, McClanahan & Mangi[6], 2004) and have been a source of conflicts. There is a perception that some fishing methods such as trawling, use of seine nets and spear guns degrade the fishing grounds. There are complaints that prawn trawling in particular is associated with wastage due to its excessive by-catch and discards which in turn degrade fishing grounds while seine nets interfere with the traditional fishing gears such as basket traps where they are set by the elderly fishers. Spear gun fishers have also been accused of destroying the corals, injuring fish and letting them go and occasionally stealing fish from the traditional traps.

Table 1 shows the statistical trends in the number of fishers, registered landing sites, fishing crafts and fishing gears in the coast of Kenya based on fisheries department frame surveys conducted in 2004, 2006 and 2008. The 2008 survey indicates that there are 141 fish landing sites. The number of fishers in the coast of Kenya increased from 9,017 to 12,077 between 2004 and 2008, reflecting an increase of about 34%. However, the number of fishing crafts increased marginally from 2,233 to 2,687 between 2004 and 2008 reflecting an increase of 20%. The predominant mode of propulsion for the fishing crafts in the district is by sails which constitute about 46% of the total enumerated crafts during 2008 frame survey. Paddles constituted about 38% while motorized vessels using outboard and inboard engines constituted only 12% and poles constituted about 4% of the total crafts (Fisheries Department[9], 2009).

The small-scale fishers use different types of gears to conduct their fishing operations. Common gears used include gill nets, handlines, beach seines, longlines, fence traps (*uzio*) and basket traps (*malema*). In addition diving masks are used to fish for lobsters.

Table 1. Number of fishers, registered landing sites, fishing crafts and modes of propulsion and fishing gears

Item	2004	2006	2008
No of fishers	9,017	10,254	12,077
No of landing sites	110	115	141
Fishing crafts	2,233	2,368	2,687
Mode of propulsion			
Sails	1,072	1,179	1,227
Paddles	1,023	991	1,021
In-board engine	66	61	98
Out-board engine	69	133	221
Pole	0	3	120
Gillnets	7374	5916	-
Monofilaments	902	1050	-
Prawn seines	226	264	
Beach seines	294	560	-
Hand lines	5,682	6,540	-
Traps	6,318	5,224	-
Longline	10,908	8,224	-
Cast nets	520	812	-
Spear guns	473	624	-
Trolling lines	608	640	-
Reef seines	158	146	

Source: Fisheries Department Frame Survey Report, 2006 and 2008

The number of small-scale (artisanal) fishers has steadily increased from 7,500 fishers in the mid 1990s to 9,017 fishers in the year 2004 to 10,276 fishers in the year 2006 and 12,077 fishers in 2008. 93% of the

total number of fishers used fishing crafts/boats while 7% did not use any fishing crafts (these are referred to as foot fishers in Kenya).

2. Biophysical

Geographical extent of the fishing activities

The small-scale fishing activities take place in the inshore shelf areas, along the coral reefs that are spread in the entire coast of Kenya (see Fig. 1). The fishing activities are concentrated in the reef-lagoons and seagrass beds. In addition, a few prawn trawlers fish for shrimp in the shallow waters of Malindi and Ungwana Bays (UNEP[10], 2006). Little domestic fishing is conducted outside the reef. Some foreign vessels from Europe have instead been licensed by Kenya Government to fish for tuna with purse-seine gear. For example 38 foreign purse seines were licensed in 2002 and 36 in 2003 to fish for tuna in the offshore waters. Although there is inadequate information on fish stocks, it is known that there are fisheries resources in the waters outside the reef which are less exploited.

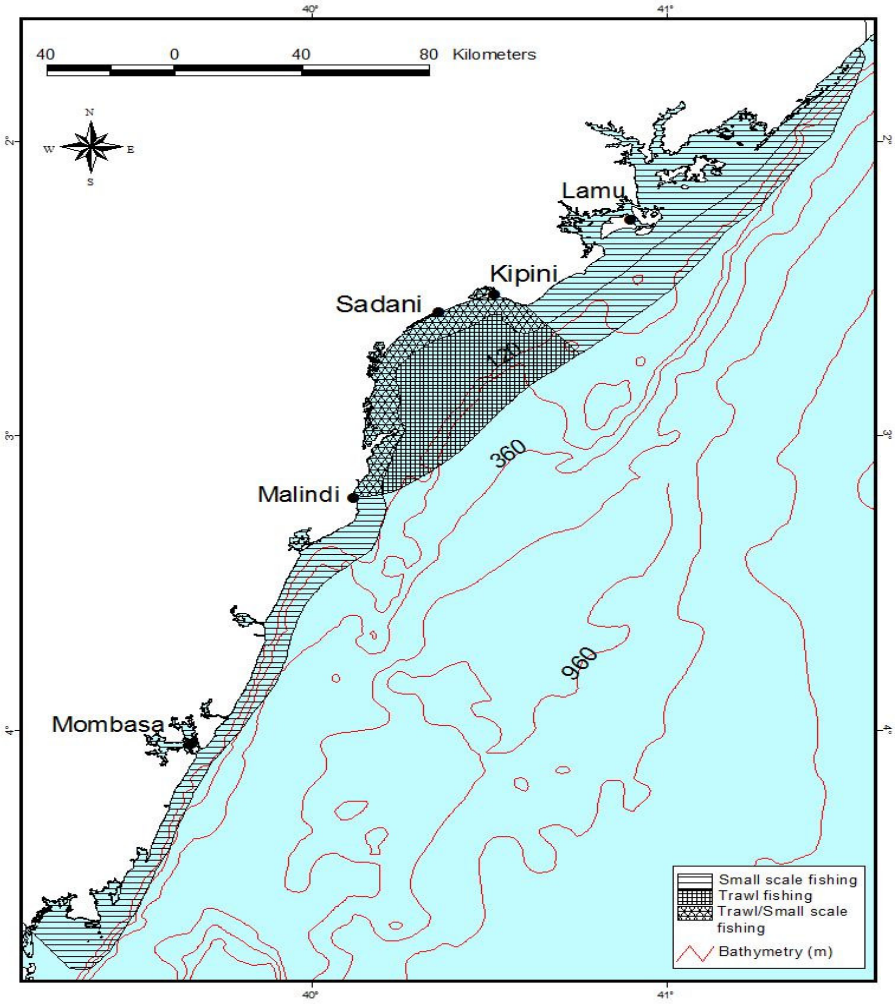

Figure 1: Map showing areas of small-scale fishing activities along the coast of Kenya

The main resources harvested by small-scale fishers

Various categories of marine fish are landed in Kenya namely demersal, pelagic, sharks and rays, crustaceans, mollusks and deep sea/big-game fish. Demersal coral reef and seagrass-associated fish species are more dominant (McClanahan & Mangi[6], 2004) in the inshore waters.

The most common demersal fish families are the scavengers (*Lethrinidae*) and the rabbit fish (*signidae*) each of which contribute about 20% of the demersal catch. The two are followed by parrotfish (*scaridae*) and snapper (*Lutjanidae*) that contribute between 6% and 8%. Sharks and rays make up around 21% of landings and pelagic species account for below 15%. The crustaceans which account for less than 10% of the total are dominated by the prawns. The mollusks and beche-de-mer account for only 2.5% of the total catch. The mollusks include squid, octopus and oysters.

Trends in fish catches

Trends in landings of different types of fish that are landed by the small-scale fishers from the inshore waters varied especially in the 1990s. For example, Kaunda-Arara *et al.*[17], (2003) reported that rabbitfishes (Signidae) showed increasing landings between 1978 and 1982 and stabilised during the period 1983-1991. Other types of fish such as the emperors (Lethrinidae), groupers (Serranidae), snappers (Lutjanidae), etc. did not show the same trend. However, in the 1990s, there was an overall decline in landings from small-scale inshore fisheries in the coast of Kenya, with total landings of demersal coral reef fish declining by about 50% during this period. This decline was more severe in Mombasa district but less severe in some districts (Figure 2). The Rabbit fish (Signidae) and scavengers (Lethrinidae) that form about 40% of the small-scale fishers' landings declined by 40% in the 1990s (Kaunda-Arara *et al.*[17], 2003). The decline is mainly attributed to increased fishing effort due to increase in population that depend on small-scale fishing at the coast.

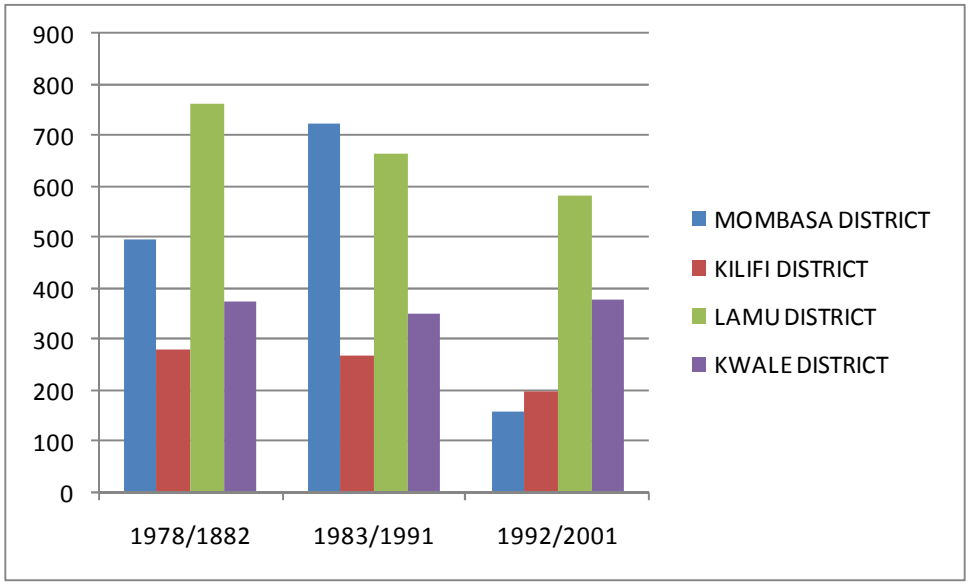

Figure 2: Trends in fish landings in the Kenyan Coast (1978-2001) (*Source: Kaunda-Arara et al., 2003*)

Trawling for shallow water prawns has also been taking place in the Malindi–Ungwana Bay and has been associated with excessive by-catch and discards. This prawn trawling has resulted in serious conflicts with small-scale fishers (KMFRI[18], 2003). This conflict of resource-use in the Bay was especially

aggravated by the lack of a management plan, which is now being developed. The conflicts prompted the government to suspend prawn trawling in 2006 until a management plan for the prawn fishery is developed. Kenya also has vibrant recreational/sport fishery, mostly targeting yellowfin tuna, sailfish, marlins and swordfishes. So far there are no reported conflicts between recreational fishers and small-scale fishers.

3. Human Environment

Dependence on small-scale fisheries is influenced by factors such as level of development, culture, poverty, etc. It has been established that levels of dependence on small-scale fishing as a primary occupation are high in areas with low levels of development. Such areas are characterized by little engagement in salaried employment and use of traditional fishing crafts with only few boats using in-board and out-board engines (Cinner et al.[19], 2009). In addition, a community's traditional rules (customary institutions) influence the management of marine resources that support livelihoods. Consequently, fishing effort has partly been regulated by the presence of traditional rules such as restrictive taboos and technological constraints. The areas where the customary institutions (traditional rules) that regulated fishing effort have broken down are now exposed to destructive fishing techniques and their fishery conditions have badly deteriorated (McClanahan et al.[16], 1997; McClanahan et al.[20], 2008; Ciner & Aswani[21], 2007; Cinner et al.[19], 2009). Emerging trends such as the increased influence of migrant fishers who have no incentive to protect and conserve fishing grounds which are far from their ancestral homes and the rapid spread of fishing methods such as beach seines and ring nets, that are destructive to the fishing grounds but appear to be more efficient and employ many people who lack their own fishing gears, have contributed towards the breakdown of customary rules and institutions. The small-scale fishers have tended to adopt the fishing techniques and life styles that been introduced by the migrant fishers. The BMUs are trying to integrate some aspects of customary rules with modern fisheries management approaches but the BMU is still a relatively new concept and some fishers have not yet appreciated it fully.

Levels of wealth and poverty in a community also determine the extent to which a community depends on primary extraction of marine resources. Poverty is widespread along the coast of Kenya with poverty levels ranging from 30% in Bura Constituency (Tana River District) to 84% in Ganze Constituency (Kilifi District) (Government of Kenya[22], 2003; Government of Kenya[23], 2002). The households that are poverty-stricken can hardly afford to eat three meals in a day. The vicious cycle of poverty is also evident in low levels of education and literacy with the coast province remaining one of the least developed regions in the country in terms of education. Literacy levels are low in the province, being higher in urban than rural areas. There is a disparity in literacy between men and women, with women having lower literacy levels. Kilifi, Tana River and Kwale Districts have the highest disparities between men and women (Hoorweg et al.[24], 2000). The low levels of education limit the chances of poor households to compete for employment opportunities, thus they tend to over-rely on small-scale fishing for their livelihood.

HIV/AIDS

HIV/AIDS has been identified as a cross cutting issue in the fisheries sector in Kenya. It is one of the major challenges facing the small-scale fishers. The Government has committed itself to availing voluntary counselling and testing, and post test support to the affected fishers and their families (Republic of Kenya[3], 2008).

Pre and post harvest sector:

Fish Trade and Marketing

Fish is bought by small and medium-scale traders at the landing sites and sell to consumers after basic processing which involves scaling and gutting the fish. In the Lamu Islands, the medium-scale traders go to designated landing sites by boat and anchor their boats for days and then transport the fish by boat to other areas where the demand is higher. Because of transport difficulties, the price of fish in this area is generally lower than prices offered elsewhere in the Kenya coast. For example, grade 1 fish is sold at an average of Ksh. 54 per kg in the Islands of Lamu while in other areas the price of grade 1 fish ranges between Ksh. 80 and 120 at the beach. Fishing effort declines during the south east monsoon when the sea is rough and fishermen are forced to confine themselves only to the sheltered bays and narrow channels. It is surprising that even during this hard time when only limited fishing is taking place, the price offered is even lower due to transport difficulties. Out of desperation, the fishermen at Kiunga for example are forced to lower the price of fish between June and September each year in order to lure the fish dealers to come and buy. It was also established that the price of fish is controlled by the dealers and the fishermen are always left in a disadvantaged position. The price of fish also varies from place to place. For example, prices at Kiunga are far much lower than prices at Kizingitini.

Mechanisms to strengthen the value chain links, between the fisher and the market

The use of improved fish smoking kilns and solar drying technology are currently being extended to areas such as Tana delta, Gazi bay and Vanga by Kenya Marine and Fisheries Research Institute in collaboration with the Fisheries Department and local non-governmental organizations (NGOs) to address the fish preservation challenges and strengthen the value chain links.

Interventions

A number of private sector investors have ventured into fish storage for example two fish dealers in Malindi have constructed their own cold stores while other dealers have fish shops that are equipped with deep-freezers. The two fish dealers who have cold stores come from the community while a few of the other dealers are from outside the community. There is however need to collect and collate this data along the entire coast. One local bank has designed a loan scheme for fishers but the fishers are yet to take advantage of this opportunity to upgrade their fishing equipment. A part from this loan scheme, there is no other micro-financing scheme for the small-scale fisheries.

Small-scale enterprises complementary to the fishing industry

There was no data on small-scale enterprises that are complementary to the fishing industry such as boat repairs. This is an information gap that needs to be addressed.

Spatial data on fish landing sites

There were 110 landing sites that were spread along the entire coast of Kenya in 2004 but the number rose to 141 landing sites in 2008. 27% of the landing sites were in the south coast (Msambweni District – 22%, Kwale District – 3% and Kinango District – 2%), while 73% were in Mombasa and the entire northern coast of Kenya (Mombasa District – 10%, Kilindini District – 11%, Kilifi District – 18%, Malindi District – 16%, Tana Delta District – 3% and Lamu District - 15%), It is however worth noting that about 40% of these landing sites are located on privately owned land and this is likely to cause conflicts when the land owner eventually decides to develop the land for private use. The Government through the Fisheries Department has planned to acquire some of the landing sites that are located on

private land and obtain land titles for the landing sites that are on public land. Despite having 141 landing sites (Figure 3), there are only 17 constructed fish sheds which are popularly known as fish bandas serving the entire 600km coastline (Fisheries Department[9], 2009).

Figure 3: Map showing the location of main fish landing sites along the coast of Kenya

Gender participation in small-scale fishing activities

Women have traditionally played a minor role in fish harvesting; fishing has traditionally been a male occupation while women handled marketing activities, however, women in some coastal areas are

increasingly getting involved in fishing activities, especially crustaceans, octopus, fish and sea cucumbers (Ochiewo[7], 2004).

Voice of fishers: Community Involvement in Fisheries Management

More recently, the involvement of local communities in fisheries management has been embraced through the establishment and strengthening of Beach Management Units (BMUs). The BMUs refer to community based organizations that have been established by the Minister responsible for Fisheries Development in Kenya to give the local communities power to participate in the management of fisheries and related aquatic resources. The pilot beach management units were first established before the Fisheries (Beach Management Unit) Regulations, 2007 was gazetted. According to these gazetted regulations, the objectives of a beach management unit are:

(a) to strengthen the management of fish-landing stations, fisheries resources and the aquatic environment
(b) to support the sustainable development of the fisheries sector;
(c) to help alleviate poverty and improve the health, welfare and livelihoods of the members through improved planning and resource management, good governance, democratic participation and self-reliance;
(d) to recognize the various roles played by different sections of the community, including women, in the fisheries sector;
(e) to ensure the achievement of high quality standards with regard to fish and fish products;
(f) to build capacity of the members for the effective management of fisheries in collaboration with other stakeholders
(g) to prevent or reduce conflicts in the fisheries sector.

The BMUs therefore have control over the activities that take place in their fishing grounds and fish landing beaches. Since their establishment, most of the BMUs are successfully operating and the Fisheries Department in collaboration with other development partners is providing support to them in terms of training to enable them understand their roles effectively and to build their capacity in management. The number of active BMUs has increased from 47 BMUs in 2004 to 141 BMUs in 2008 (Fisheries Department[9], 2009). This implies that all fish landing sites now have BMUs. When the BMUs were first introduced, the traditional beach leaders who were responsible for the continuity of customary institutions were the first to be elected officials of BMUs. This ensured that there was no conflict between BMUs and customary institutions and the Government regulations were positively received.

Besides BMUs, fisheries cooperative societies most of which had collapsed are being revived especially in Lamu District. The fisheries cooperative societies had been established in accordance with the Cooperative Societies Act (Amended), 2004, which is the national legislation governing establishment and running of cooperative societies in all sectors of the economy in Kenya. The main objective of the cooperative societies in Kenyan is to promote the welfare and economic interests of the members. The fisheries cooperative societies in particular have the following objectives: (i) to market fish on behalf of the members, (ii) to collect revenue and provide credit to members to enable them acquire new fishing equipment, and (iii) to give the fisher communities voice to participate in fisheries management. The major challenges facing many cooperative societies in Kenya include poor governance and limited transparency in the management of cooperatives; lack of capacity in management, market intelligence and market research; weak capital base; infrastructural weaknesses (International Monetary Fund[25], 2007). The fisheries cooperative societies in the coast of Kenya collapsed between mid 1990s and early 2000s due to mismanagement, low levels of education among the officials and claims of corruption. However, a few fishermen cooperative societies have been revived particularly in the larger Lamu District in the northern coast of Kenya. These cooperative societies are managed by elected management committees, and are required to employ trained staff to facilitate their operations. Like in the case of BMUs, the

Fisheries Department in collaboration with development partners is building their capacity through training. Their roles are clearly defined to avoid conflicts with the BMUs.

4. Policy and Governance

The fisheries sector in Kenya has been regulated and governed by the two main legislations, the Fisheries Act (Cap 378) of 1989 and Regulations (191), and the Maritime Zones Act (Cap 371) of 1989. Several regulations have also been made to cater for the rapid changes in the fisheries sector. However, it is worth noting that this sector operated without a dedicated policy document between 1963 when the country became independent and 2008 when the first National Oceans and Fisheries Policy, 2008 was launched. This means that the fisheries sector lacked a comprehensive policy framework for decades. The management of the fisheries sector has therefore been guided by policy statements and guidelines that have been provided in the National Development Plans that are prepared after every five years, the National Food Policy (1981 and 1994) which aimed at promoting food security, the District Focus for Rural Development Policy (1985) which aimed at promoting a bottom-top approach to development planning, the Poverty Reduction Strategy Paper (2001), the Environmental Management and Coordination Act of 1999, the Economic Recovery Strategy for Wealth and Employment Creation (2003), the Kenya Vision 2030 and the Medium Term Plan 2008-2012. The Oceans and Fisheries Policy has recognized the policy statements that were scattered in these documents. Highlights on the Fisheries Act, the Maritime Zones Act and the National Oceans and Fisheries Policy are provided below.

The Fisheries Act (Cap 378) of 1989

All fisheries in Kenya are regulated and governed by the Fisheries Act (Cap 378) of 1989 of the Laws of Kenya. The objective of this legislation is to provide an appropriate legal framework for the management, exploitation, utilization and conservation of fisheries in Kenya. It covers the inshore and offshore fisheries, all marine species, migratory and straddling stocks. The Fisheries Department is charged with the responsibility of enforcing this legislation with directions from the Minister responsible for fisheries development. This legislation is backed by a comprehensive set of regulations known as the Fisheries Regulations (1991). The management regulations provided by this legislation include licensing, gear restrictions, area closures, size limits, education and extension and research. According to the Fisheries Act, small-scale fishers (except those who fish for consumption) require a license to access the inshore fisheries but not all of them have complied. In terms of entry criteria, the small-scale fishers are required to state the species of fish being targeted, the type of fishing gear that they intend to use, method of fishing and area. The small-scale fishers are required to pay a small fee of Kenya shillings 100 to obtain the fishing license annually. Although this legislation governs all fisheries in Kenya, it places a lot of emphasis with specific provisions for the small-scale inshore fisheries. Since small-scale fisheries accounts for about 95% of all the fish landings in the Kenyan coast, and fisheries is treated as a sector in this legislation, its position in the coastal zone is distinct. In order to make this legislation more responsive to the changes that have occurred in the fisheries sector, it is currently under review and it is hoped that when the reviewed version comes into force, it will be more comprehensive and will give a legal backing to all aspects of development and management of the small-scale inshore fisheries. It does not explicitly provide for exclusive zone for small-scale fisheries but defines fisheries management measures that give rights to small-scale fishers to benefit from the inshore fisheries.

This legislation is being implemented by the national fisheries authority, the Fisheries Department of Kenya and the Ministry responsible for Fisheries Development. The Fisheries Department is responsible for the overall management of fisheries resources, including the small-scale fisheries in Kenya. The Fisheries Department manages the fisheries resources in collaboration with the Non-Governmental Organizations (NGOs) and other stakeholders in the fisheries sector. This has further been explicitly stated in the Oceans and Fisheries Policy which has precisely defined the role of Community Based

Organizations (CBOs), Associations of Producers, NGOs and other stakeholders in the fisheries sector to include participation in marketing, financing and research with a view to creating an enabling environment for investment, improved production, trade and commerce. The Beach Management Units have been created through the Fisheries (Beach Management Unit) Regulations, which were published in a gazette notice in 2007 to strengthen community participation.

The Maritime Zones Act (Cap 371) of 1989

This legislation provides a legal framework for the management of Kenya's territorial waters and the continental shelf; the establishment and delimitation of the exclusive economic zone of Kenya; the exploration and exploitation and conservation and management of the resources of the maritime zones; and for any other economic uses. It defines the outer limits of Kenya's territorial waters where small-scale fishing activities take place. It also provides for prescribing measures for the protection and preservation of the marine environment and regulating the conduct of scientific research.

National Oceans and Fisheries Policy

The National Oceans and Fisheries Policy which came into force in 2008, proposes a coordinated framework for addressing the challenges facing this sector. It comprehensively covers various issues that affect small-scale fishers and fisheries in the Kenyan inshore waters. Its primary goal is to ensure increased and sustainable fish production and utilization through proper management of the ocean and other water bodies. The main objective of this policy is to enhance the contribution of the fisheries sector to wealth creation, increased employment for youth and women, food security, and revenue generation by fostering effective private, public and community partnerships. The policy also aims at securing the rights of vulnerable groups and traditional fisher communities, thereby recognizing their rights, history and culture. It also explicitly states the Government's commitment to promotion of gender equity, and integration of HIV/AIDS prevention and management. The Policy provides for promotion of fish consumption as a means of increasing food security (Republic of Kenya[3], 2008). The Policy has the following guiding principles: good governance with emphasis on co-management and transparency, ecosystems/holistic approach to resource management, pro-poor, precautionary approach that involves taking management measures based on best available information, promotion of public-private partnership, sustainability and environmental integrity, subsidiary/delegation, and equity. On co-management, this Policy has made explicit provision for promoting the role of Beach Management Units (BMUs) in the management of fisheries resources.

This Policy has identified the need to review the Fisheries Act and the Maritime Zones Act and other related statutes to create a harmonized legal framework to ensure effective management, coordination and regulation of the fisheries and oceans sector. The policy has also defined the necessary institutional framework which includes the establishment of Kenya Oceans and Fisheries Council to advise and review the oceans and fisheries sector; creation of the Kenya Oceans and Fisheries Services to harmonise the fisheries extension, development, management and marketing; and restructuring of the Kenya Marine and Fisheries Research Institute to offer effective and timely research to guide Kenya Oceans and Fisheries Services. The policy has stated in its implementation plan that the creation of this institutional framework should be carried out in the period 2008-2010. Significant progress has been made towards achieving this target but it has not been fully achieved because the creation of Kenya Oceans and Fisheries Service requires a review of the fisheries legislation. A review of the fisheries legislation has been going on since then; the Fisheries Bill 2009 has been prepared and is being popularized now before being taken to Parliament for enactment during 2010.

Mechanisms to improve the ability of key institutions to support the fishing industry beyond the life of the ASCLME Project

In the short term, the Oceans and Fisheries Policy has spelt out the mechanisms to improve the ability of key institutions to support the fishing industry beyond the life of the ASCLME project. The Fisheries Department is being reorganized into four directorates which are charged with specific tasks.
The directorates include the directorate of ocean and deep sea fisheries which is responsible for the development of coastal and marine fisheries; directorate of aquaculture which deals with freshwater aquaculture and mariculture development in the country; directorate of freshwater fisheries which is responsible for development of capture fisheries in the freshwater bodies; and directorate of fish quality assurance which responsible for promotion of fish quality assurance, value addition and marketing. There is however no department that deals specifically with small-scale fisheries. The Kenya Marine and Fisheries Research Institute is also being restructured to promote and coordinate demand driven fisheries research. The MCS capacity is also being strengthened through provision of modern equipment, skills and resources (Republic of Kenya[3], 2008).

5. Planning and Management

There are no specific fisheries management plans for small-scale fisheries. However, the development of the first prawn fishery management plan is at its final stage. This plan will address the interests of both small-scale fishers as well as the semi-industrial prawn trawlers. Plans to develop a management plan for the lobster fishery are also at an advanced stage.

As discussed in the previous section some specific mechanisms to deal with small-scale fisheries are in place. For example, BMUs have been established to give voice to the small-scale fishers. All fishers who operate in an area are required by the BMU regulations to register as members of the BMU that is responsible for managing that area and should abide by its by-laws. The BMUs are responsible for vetting the fishers who should be issued with fishing licenses by the Fisheries Department. Since the BMU leaders know all the small-scale fishers who operate in their areas of jurisdiction, their involvement in fishing licensing has improved compliance with the licensing requirement and most small-scale fishers now possess the fishing licenses. Similarly, there are Marine Protected Areas (MPAs) that have been established for biodiversity and fisheries management in Kenya. So far four marine parks which are managed as no take areas have been established. In addition, six marine reserves have also been established where only traditional fishing methods are allowed. However, the fishers did not participate in the decision-making and setting of these zones thus causing resistance at the beginning. While the marine parks are no take zones, marine reserves provide preferential access to small-scale fishers who use traditional fishing methods such as traditional fishing traps. Fish stocks that are found in the marine parks are managed by the Kenya Wildlife Service while stocks in the marine reserves fall under the jurisdiction of both Kenya Wildlife Service and Fisheries Department.

Integrated coastal zone management plans

So far integrated coastal zone management plans are being developed under the leadership of Kenya's National Environment Management Authority.

Open access vs limited access fisheries management

The small-scale fisheries are largely characterized by open access. A small-scale fisher only requires a fishing license for which he/she pays KSh.100 (where, KSh.75 = US$1). To the small-scale fishers, the licenses are legitimate since it gives them identity and enable them to fish without conflict with the

fisheries law. While BMU is responsible for vetting small-scale fishers who require licenses, anybody can get one as long as he presents himself to the Fisheries Department and states that he intends to use legally accepted fishing gears. This is because licensing has traditionally been the responsibility of the Fisheries Department and the BMU is a relatively new approach.

Monitoring, control and surveillance (MCS) capacity of the relevant institutions

The MCS capacity of the relevant institutions is largely inadequate and needs to be strengthened through provision of modern equipment, skills and resources (Republic of Kenya, 2008). At the moment, those who are engaged in informal fishing avoid being arrested by making use of mobile phones to receive information about MCS missions. Consequently, some destructive fishing practices such as the use of beach seines, small-mesh-size nets and other inappropriate fishing gears still exist in some areas of the coast. For example, the use of beach seines is still common at Faza in the larger Lamu District and at Majoreni in the newly created Msambweni District. The use of beach seines is more common at Faza during the south east monsoon winds that occur between April and August when the sea is rough.

6. Development, Trade and Projects

Supplementary livelihood programmes

Mariculture is currently recognized as a suitable supplementary source of livelihood and income for the small-scale fisher communities along the coast. The small-scale fishers are faced with declining catches and lack of capacity to venture into offshore water fisheries. The best candidate species for community based mariculture along the Kenyan Coast include mud crab culture which has been tried locally by Kwetu at Mtwapa, Wasini Women Group in the South Coast, Tsunza conservation and management group in Mombasa (Mwaluma[26], 2002) and Dabasso mangrove conservation group at Mida creek. Studies on mud crab farming indicate that low cost pens that are integrated in mangroves do not require large amounts of capital inputs and can be economically viable as long as labour is available. Finfish culture (Milkfish and mullets), and in some situations polyculture of fish and shrimps (Mirera[27], 2008) has also proved feasible. Research has also shown that seaweed culture is another alternative source of livelihood and income especially for women.

The aquarium fishery in Kenya is another supplementary source of livelihood. Kenya ranks among the top exporting countries in the marine aquarium fish trade in the Western Indian Ocean (Okemwa *et al*.[28], 2006). There were 145 licensed marine aquarium fish collectors who were working full time between 2004 and 2005. These collectors were either employed or contracted by 8 companies that were licensed to export marine aquarium fish in Kenya. Most of the aquarium fish from Kenya is exported to around 15 countries including the United Kingdom, USA, South Africa, Hong Kong, Germany, France, Japan, Netherlands, Austria, Israel, Denmark, Poland, Hungary, Italy, and Romania. Generally, aquarium fish collectors target juveniles because they are more colourful, easier to handle and transport by air (Wood[29], 2001).

Large-scale development projects implemented by the state

The state through the Ministry of Fisheries Development is developing cold stores along the coast. By January 2010, three cold stores have been established with one located at Vanga in the southern-most part of the Kenyan coast, one is located at Malindi Town and one is at Faza in Lamu district.

Trade and marketing arrangements

The bulk of fish especially finfish from the small-scale fishery in the coast of Kenya is sold in the domestic market. Once fish is landed, it is bought at the landing sites by small-scale and medium-scale fish traders. Small-scale fish traders refer to fishmongers who do not have their own retail shops and refrigeration facilities while medium-scale fish traders are those who have their own retail shops that are equipped with refrigeration facilities. The small-scale fish traders perform some basic processing which includes scaling and gutting before fish is sold to the consumer. Some of the small-scale fish traders sell the fish to the consumer in a semi-processed form while others cook the fish and then sell in the open air markets. The medium-scale traders preserve their fish in deep freezers and sell to consumers who buy from their retail shops. Some of them transport their fish to urban centres where fish is sold in retail fish shops. Some of the medium-scale fish traders also have their own fishing boats which are manned by employed captains. A few medium-scale fish traders have cold rooms where they preserve fish before selling. Both small and medium-scale fish traders are spread along the entire coast of Kenya.

While finfish is basically sold in the domestic market, most of the Octopus and Lobsters which are landed by small-scale fishers are exported. They are bought by medium-scale fish traders at the landing sites who in turn sell them to the companies that export them. The medium-scale traders who deal in Octopus and lobsters operate like middlemen who collect for the exporter. The companies in turn are responsible for transporting these products from the collection points (fish shops) to their premises. In the year 2005, two companies exported 566,198 kilograms of Octopus and two other companies exported 2,760 kg of lobsters (Fisheries Department[11], 2005). Prawns and Tuna were also exported but these were caught by semi-industrial trawlers and foreign industrial fishing vessels. Aquarium fish and sea cucumbers are also exported to various destinations annually (Ochiewo *et al.*[30], 2010; Okemwa *et al.*[28], 2006). While aquarium fish and sea cucumbers are exported to various destinations, European Union (EU) is the biggest market for Kenya's fish.

7. SWOT Analysis

Strengths	**Weaknesses**
• The Oceans and Fisheries Policy, 2008 provides a strong policy framework for the development of small-scale fisheries. The main fisheries legislation, the Fisheries Act cap 378 of the Laws of Kenya is currently being reviewed to capture the objectives of the new policy and to make it responsive to the needs of and the changes that are occurring in the fisheries sector. • Participation of the small-scale fishers in fisheries management through the new co-management approach that gives prominence to Beach Management Unit gives voice to these fishers. • The Fisheries Department which is the main fisheries regulatory authority is being reorganized to provide an effective and efficient institutional framework.	• Lack of management plans for specific fisheries in the inshore waters is a glaring weakness. There is need therefore to support preparation of management plans for specific fisheries. • Although co-management is being promoted, the capacity of fisher-communities to participate effectively in co-management is still low. There is need therefore to invest in sensitization and awareness programmes. • Information which is currently available to inform small-scale fisheries governance is largely inadequate. For example, there is inadequate information on fish trade especially with respect to fish from the marine waters. Trend data on quantities of different species exported, export prices, number of people involved and number of those who benefit from the export trade and

	the destination countries should be gathered and analyzed. • Lack of data on small-scale enterprises that are complementary to the fishing industry such as boat repairs. • Inadequate training in aspects such as statistical and socio-economic data collection, analysis, interpretation and reporting; fish stock assessments, etc.
Opportunities • A few private investors have ventured in commercial grade processing for example, Sea Harvest Ltd that buys octopus from fishers and processes before export. Private companies such as East African Sea Foods, Mombasa Ship Chandlers, Wananchi Marine Products, are currently importing fish from other countries thus showing that there is a supply deficit in the country. This provides an opportunity that small-scale fishers can tap on if they can venture into non-traditional fishing grounds. These private companies are able to provide their own transport the landing beaches where they can buy the fish from small-scale fishers thus strengthening the value chain links. • Three cold rooms have been constructed by the Government to support the small-scale fishers and these should be tapped into to ensure that fishers obtain competitive prices for their fish. • A local bank has developed a loan scheme for the fisheries sector. This loan scheme offers a good opportunity for fishers to upgrade their fishing equipment. • The ASCLME should support data generation and a programme to encourage small-scale fishers to venture into non-traditional fishing grounds. The capacity of small-scale fishers should also be built so that they are able to diversify their economic activities.	**Threats** • There is evidence of over-exploitation of coral reef fisheries. • A number of fish landing sites have been lost to private property developers. • There has been some stiff competition from prawn trawlers who share the same fishing grounds with the small-scale fishers in the Malindi-Ungwana bays. This is a serious threat if not addressed. • There is competition over market from recreational fishers who sell their catch to the local tourist hotels who are also the buyers of fish landed by small-scale fishers.

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Overview of Coastal Tourism Product in Kenya

1. Introduction

Kenya, a country long famous for its tourism attributes, was ranked 18th regionally and 97th overall in the world according to the World Economic Forum Report of 2009[1]. Kenya is one of the most developed tourism destinations in sub-Saharan Africa[2] and since its independence in 1963 has become a popular destination for visitors from Europe, North America and other developed countries[3]. The country receives over 6% of the total international tourist arrivals to Africa, and the relative importance of tourism in Kenya's economy has risen steadily over the last 40 years[4]. The number of visitors to Kenya has been steadily rising over the years rising from just over 814,000 in 1990[1] to over 2 million annually in 2007[5,6].

Tourism contributes about 5 per cent of GDP and 4 per cent of total employment in Kenya. Despite this seemingly low contribution, however, the general tourism economy, which captures backward and forward linkages, contributes 11.6 per cent of GDP[1] making it the third largest contributor to the GDP after agriculture and manufacturing[7]. Tourism has been recognized as one of the sectors that will drive economic growth towards achievement of Kenya's Vision 2030[8]. Consolidated tourism earnings expanded from Kshs. 56.2 billion in 2006 to about Kshs. 65.4 billion in 2007, reflecting an 11.6 percent growth[6]. The tourism sector provided more than 483,000 jobs in 2008[1].

Natural attractions are central to the Kenyan tourism product and surveys carried out in the 1990's indicated that 70% of international tourists were motivated to visit Kenya primarily by the unique opportunities for viewing wildlife in a natural setting[10]. Kenya is ranked 25th for its natural resources, with two World Heritage natural sites and its rich diversity of fauna[1]. Recent studies have also shown that tourists are attracted by indigenous culture and pleasant weather conditions[11]. The performance of the Kenyan tourism sector is currently experiencing challenges in terms of the escalation of global terrorism, infrastructural deficiencies, static and un-innovative products, meager resources allocated for promotion and marketing, declining standards of tourism products and increased regional competition[12].

1.1 Coastal Tourism Overview

Kenya's coastal tourism is driven by beach tourism[2]. The Kenyan coast has extensive white sand beaches fringing the warm waters and coral reefs of the Indian Ocean. The coast is also a place with a long and exotic history. The Kenyan coast is home of Swahili culture and the monuments at Fort Jesus and ruins of ancient settlements exhibit a rich cultural heritage. There are endemic coastal forests such as the Arabuko Sokoke and Shimba Hill Reserve. The city of Mombasa is one of the most active and exotic ports on the African coast, with nightlife to match[6]. Several well-known luxury beach hotels exist along the coastline of this country[13]. Other attractions include wildlife sanctuaries and marine parks[14]. Tourists who visit the Kenyan coast generally are mainly from Western Europe and North America[6].

The tourism sector in Kenya accounts for about 18% of foreign exchange earnings of which the coast contributes between 52% and 68%. The coastal tourism contribution has been driven by the rich marine and coastal attractions and protected areas[15]. Compared to other important economic sectors at the coast, tourism contributes significantly to the coastal economy accounting of 45% of the share contribution to the coastal economy (Figure 1)[16].

The coastal area generates the highest number of bed occupancies in Kenya with an average of 55% of total bed nights in Kenya[13, 17, 19]. In 2006 for example, the coastal province of Kenya accounted for

3,420,300 bed nights (57%) of bed nights compared with 1,204, 000 (20%) bed-nights for Nairobi. The average length of stay for a visitor in the country in 2005 was 14 days with 6.8 million overnight stays[17]. The Coast also has the highest number of tourism enterprises in Kenya accounting for close to 50% of hotels and 43% of tour operators[19, 20].

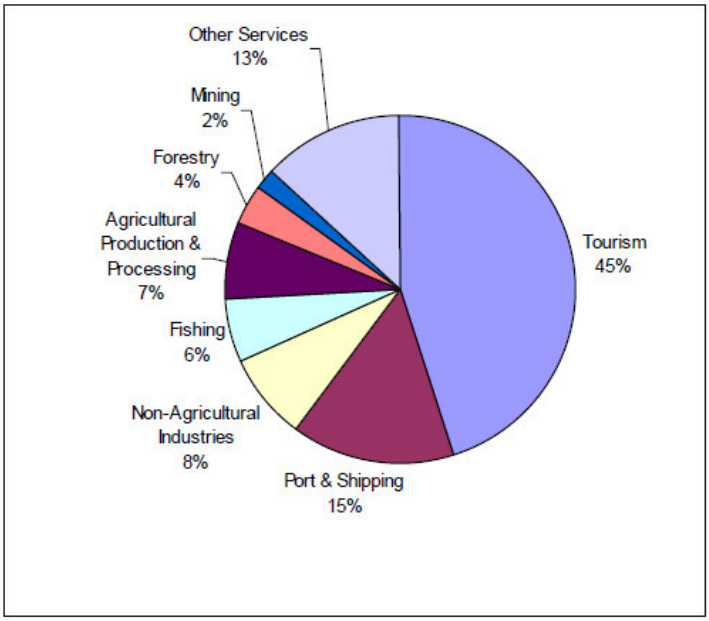

Figure 1. Share contribution of different economic sectors on the Kenya coast[16]

Tourism currently accounts for about 11 percent of Kenya's Gross Domestic Product (GDP), making it the third largest contributor to GDP after agriculture and manufacturing, and Kenya's third largest foreign exchange earner after tea and horticulture[1]. The tourism sector has been identified as one of the sectors that shall contribute significantly towards poverty alleviation as set out in the Government's *Economic Recovery Strategy for Wealth and Employment Creation 2003-2007*. The tourism sector is a major source of employment, estimated in 1998 at over 500,000 jobs, of which some 360,000 jobs were in the formal sector and 180,000 jobs in the informal sector. The sector is also a major source of Government Revenue in the form of taxes, duties, licence fees and entry fees[1].

Table 1. Table showing contribution of Coast province in bed occupancy

Zone	1998	1999	2000	2001	2002	2003	2004
Coastal-Beach	1,505.3	1,625.2	2,065.2	1,438.2	2,171.8	1,269.6	1,883.5
Other	109.1	73.9	85.8	136.1	108.2	36.5	29.4
Coastal Hinterland	43.9	48.7	76.3	56.6	44.9	60.9	52.9
Total Occupied in Kenya	2,813.0	2,951.0	3,687.8	2,764.10	3,479.4	2,605.9	3,791.5
Coast Province Contribution (%)	**58.9%**	**59.2%**	**60.4%**	**59%**	**67.6%**	**52.4.0%**	**52%**

Source: CBS; Economic Survey 2005

Tourism accounts for 8.7% of direct and indirect employment in Kenya[7]. The number employed at the coast is not known. The sector has lately been facing a down turn[12] with subsequent impacts on livelihoods.

For example in 1997 when the bed occupancy rates dropped to less than 35%, 90,000 hotel employees out of a total 150,000 lost their jobs. In the year 2008, the tourism sector in Kenya recorded one of its worst performances ever in real terms following insecurity in the first quarter of 2008 and subsequent travel bans which drastically reduced the number of international arrivals by 30.4% from 1,048,732 visitors recorded in previous year [21]. Tourism earnings decreased by 19.2 per cent from Ksh 65.2 billion in 2007 to KSh 52.7 billion in 2008. Bed occupancy rate dropped to 26.0 per cent in 2008 from 47.2 per cent in 2007 while visitors to Game Parks and Reserves decreased by 34.5% [22].

At the micro level despite the government's effort to strengthen the industry it remains doubtful whether the sector is achieving its goal of contributing to rural development and prosperity. Studies carried out on the benefits of tourism to local livelihoods show that little benefits accrue to the local economy[13]. The development of Kenya's tourism since the early 1960's has a significant bearing on this trend. It has been characterized by unplanned and skewed tourism development, poor employment opportunities for the local people and cultural erosion[2]. The development of tourism at the coast is also spatially constrained to a few locations and the majority of people do not receive any form of direct monetary benefit from the industry. The few who live near tourist beach resorts perform relatively meagre jobs in the countries hospitality establishments[3, 13]. They tend to occupy unskilled, servile and lowly paying positions including waiters, gardeners, porters, janitors and security guards. In most instances, the well-paying job positions, at supervisory and managerial level, are occupied by expatriates[11].

Due to the increasing trend of inclusive tour packages [11] using only a limited number of destinations on the Kenyan coast and tourist attraction sites, fewer tourist revenues are reaching Kenyans at a grassroots level. The number of all inclusive tourists has been shown to exceed 80% of international tourists [10, 11, 13]. Consequently, the local people, who bear most of the costs of tourism development and wildlife conservation, barely receive any form of direct monetary benefits from the tourism industry[13]. It has been estimated that only between 2% and 5% of Kenya's total tourism receipts trickle down to the populace at the grassroots level, in forms of low paying and servile jobs, and the selling of souvenirs and agricultural produce[13].

The dominance of the industry by multinational corporations has also contributed to the uneven distribution of tourism benefits. These corporations own and manage airlines, tour firms, and accommodation facilities[11]. The local economy loses benefits from unemployment since many tourism enterprises are foreign owned and expatriate managed and most of the foreign exchange is repatriated through wages, management fees, profits, dividends, and franchise agreements[2].

The external ownership has meant that benefits flow outside the country. In Malindi for example there's dominance of the industry by Italian investors and tourists. When Italian tourists arrive in Malindi they have very little contact with the locals thus the end result is a tourism product which is almost exclusively owned and managed by Italians. It has been estimated that these forms of travel arrangement account for leakage of as much as 80% of total tourism receipts. Such scenarios have left the locals of Malindi engaging in marginal and informal business activities (generating minimal profit) such as hawking and vending of souvenirs along streets[25].

2. Biophysical Issues

Major tourist attractions at the coast include the wildlife, white sandy beaches, sun, sea, scenic features, diverse cultures, hospitable people, historical sites, national museums, national parks and reserves near

the coast and tourism facilities of international standard such as hotels and the airport[23]. These products are well distributed along the entire Kenyan coast. However in terms of benefits from tourism, some areas of the Kenyan coast benefit more from tourism. Much of the tourism activities and facilities at the coast are centred on the major beach towns of Mombasa, Malindi, Lamu, Kilifi and Watamu (Figure 2)[24, 25].

Beach tourism occurs primarily in four popular areas on the coast of Kenya, stretching some 400 miles. They are Diani Beach on the south coast, Mombasa in the north, and Malindi/Watamu and the Lamu archipelago. In all four locations, hotels have been built in response to increased tourist demand. These areas have sandy beaches and warm sea water sheltered by coral reefs[26].

Figure 2. Map showing predominant areas of tourism development on the Kenyan coast[24]

The rapid growth of coastal tourism in Kenya in the 1960's contributed to environmental degradation of the marine ecosystem. Studies have shown that beaches have seriously been degraded and polluted, coral reefs and mangrove forests substantially destroyed and marine species adversely affected due to over-concentration of tourism activities[18, 27]. Mass tourism has led to the overutilization of the natural resources, and the problem is worsened by the geographical concentration of tourists in some places along the Kenyan coast like Mombasa and Malindi[2]. Lack of effective waste water treatment for tourist facilities is making a significant contribution to coastal water pollution. Thus the quality of the coastal tourist attractions is increasingly being reduced[13].

The rapid growth of coastal tourism in the 1960's led to haphazard hotel development on the Coast and the inadequate provision of accommodation for the support population. These developments did not proceed in a planned manner. They were merely *ad hoc* responses to the increased volume of tourist traffic. This apparent lack of planning has brought with it a number of problems[26]. Unplanned and haphazard mushrooming of tourism and hospitality facilities in fragile coastal and marine ecosystems is resulting in severe problems of resource degradation. In the long-run, the quality of the coastal tourism product is being compromised. Hotels have been constructed that interfere with delicate marine ecosystems (lagoons, fragile sandy beaches and coral reefs) without taking into consideration the environmental impacts of those facilities. High concentrations of tourists in fragile marine environments

have led to problems of overcrowding, trampling and overexploitation of marine resources, such as coral reefs, mollusc shells and marine turtles[27].

Negative impacts on coastal areas from the growing tourism industry from an environmental perspective include:

1. Increased consumption and exploitation of coastal resources leading to unsustainable use and degradation in certain areas.

2. A concentration of land holdings and alienation of local land and resource rights in highly valued coastal areas[24].

To counter the negative effects on tourism on the environment the government has sought to regulate environmental impacts of tourism developments in recent years, as well as to increase the statutory protection of coastal resources. Kenya passed the Environmental Management and Coordination Act in 1999, which has had a major impact on tourism facilities in terms of forcing compliance with improved environmental standards[28].

3. Human Environment

The Kenyan Coast Province accounts for over 50% of the total national tourism earnings[15]. However, despite the large share contribution to the national economy [27] the coast region remains one of the poorest in Kenya. Poverty incidence in Coast as a whole is 57.6%. Coast Province comprises 21 political constituencies with half of the constituencies having a poverty headcount index that is above the provincial mean of 31%. According to the Kenya Integrated Household Budget Survey 2005/06, the Coast Province has the second highest incidence of poverty in 8 provinces in Kenya[29]. Earlier welfare monitoring surveys indicated that in 1994 the coast province had 55% of its population living in absolute poverty and in 1997 it rose to 62% [30]. The coast is a food deficit region[31] and therefore the tourist industry relies mainly on the highlands for its food supply[32].

Another human challenge facing the Kenyan coast is the significant number of immigrants from other parts of Kenya over the last century thereby accounting partly for the population change experienced in the long term. Out of a total of 421,935 migrants to Coast Province in 1989, 16,441 were from outside Kenya. The high level of migration into the coast region is of great concern because it is increasing the demand on scarce resources with consequent degradation of the coastal environment and is now a security concern. Migration to the coastal region is mainly due to employment opportunities, the growth of the tourism industry and access to social facilities among others. The rapidly increasing human population combined with poor resource management has led to degradation of coastal resources as indicated by impacts such as over-exploitation near shore fisheries, degradation of mangrove areas, shorelines changes and cultural erosion[16].

Tourism at the coast has resulted in erosion of cultural values. The locals feel that tourism has resulted in decreased morality in the coast. A study of Malindi revealed that residents now tolerate misbehavior from the locals because they have internalized these behaviors as an inevitable by-product of tourism. Examples of immoral behavior include prostitution, sex tourism, consumption of drugs and related behaviors[33]. Kibicho[34] has shown a significant relationship between tourism and the growth of the sex trade in Kenya's coastal region. The coastal strip is notorious for sex tourism. It caters for about 66% of Kenya's tourism activities and although no precise figures are available, sex tourism is one of the main activities at the coast[2]. Sex tourism has forced many sex workers to learn foreign languages for without such skills they cannot perform their work well[23].

Child prostitution is also emerging in the coast involving young boys and girls. This was previously not very common in Kenya but with HIV/AIDS, many orphaned children are now turning to prostitution[23]. Children have been victims of the thriving sex tourism in the Kenya coast. The most recent UNICEF report shows that tourists who sexually exploit children are at the centre of a racket that involves many people from the local community of Kenya's 100 mile coastal strip[35]. Tourism is also blamed for non-attendance of schools by young children. Enrollment rate in schools stand at 63.4% despite government intervention to provide free primary education. The government has put in place legislation to protect children from sexual exploitation. The Sexual Offences Act of 2006 protects against exploitation of prostitution and committing indecent acts with children[36]. The Children's Act also protects the child against sexual exploitation[37].

Case study of a successful community ecotourism project on the Kenyan coast

Communities living adjacent to Marine Protected Areas (MPAs) in Kenya benefit directly from a range of tourism-related employment opportunities. For example providing boat services, managing tourist attractions such as boardwalks, etc[41]. Local community boat operators earned an estimated US$ 1.6 million from Kisite Marine Park in 1999[42]. Further communities living near Kisite Marine Park have a greater security than since they were able to obtain food readily as a result of better cash flow[43]. Access to markets by communities is hindered by inadequate capacity by community ecotourism groups. With improved business management skills communities near MPAs stand to more from ecotourism [44].

Communities near protected Kenya coastal forests also derive direct benefits from tourism. In Shimba Hill the community started an elephant sanctuary with the assistance of Kenya Wildlife Service in 1995. This was in response to avert human–wildlife conflict, involving elephants that kept disrupting the local community's agricultural activities. The ownership of the sanctuary is based on a membership scheme, in which the local communities own shares based on the amount of money or time invested in establishing the sanctuary.

The sanctuary employs 19 full time staff, including a manager who runs the enterprise[45]. In the Arabuko Sokoke Forest the community is engaged in a butterfly farming project. In 1993 at the start of the project the community's annual per capita income was about US$ 40. Through the project most of the locals now have earnings from up to US $ 1,000 per year depending on their individual efforts. The groups are also actively involved in forest protection, advocacy and awareness creation of the benefits of the nature based enterprises[46].

4. Policy and Governance of Tourism

The first National Tourism Policy of Kenya was formulated under *Sessional paper No. 8 of 1969*, entitled *Tourism Development in Kenya*. The Policy set growth targets and spelt out strategies on how the government and private sector would develop tourism so that it became one of the nation's leading economic activities[47]. Since then, successive National Development Plans and other relevant public policy documents (including the Japanese-funded National Tourism Master Plan of 1995) have placed great emphasis on the development of the tourism sector through creation of an enabling environment and maintenance of an open door policy towards foreign investment in tourism[18, 47].

In recent years, the tourism sector worldwide has undergone considerable change. This has given rise to a need to revise and update the National Tourism Policy to ensure that Kenya continues to benefit from what has now become the leading global industry. In 2002, the Ministry of Tourism and Wildlife

initiated the process of developing a comprehensive tourism policy and legislation. Although a draft policy and bill have been developed, they are yet to be finalized[47].

The Kenyan government is generally very supportive of expanding the tourism sector, recognizing it as a high-potential growth area. The government has enhanced its commitment to aggressively market Kenya since 2003 as a way to revive the industry. It has endeavoured to provide an enabling environment for the private sector. In general, while policies are geared toward promoting tourism development and investment in various ways, the *de facto* reality is that tourism is largely unregulated. Kenya's coastal tourism industry has developed largely in the absence of any formal planning processes[24]. For example Coast province accounts for 65% of overall tourism activities in Kenya but has been facing persistent infrastructural problems that have impacted adversely on the development of tourism[6].

According to the Travel and Tourism competiveness report of 2009, Kenya's present policy environment is not generally conducive to the development of the tourism sector. Thus Kenya is ranked 90th out of 133 countries with respect to the tourism regulatory framework. Factors contributing to the poor ranking include Bilateral Air Agreements that are not open, insufficient protected property rights and much time and cost required for starting a business. In addition, infrastructure remains under developed and health and hygiene levels require improvement. Finally, the security situation in the country remains a significant hindrance to further developing the sector[1].

Since the first statement of national tourism policy was formulated three decades ago, there have been considerable changes on the political, economic and social fronts within the country. These changes have coincided with increased transparency in official policy, greater economic liberalisation, and the disengagement of Government from the ownership and operation of tourist facilities. The role of government has changed with more focus now diverted to planning, development, promotion, facilitation and service provision rather than that of being directly engaged in commercial activities. The international scene has also changed with tourism and travel growing to become the world's largest industry. Also with the rapid development of new technology, tourism has become much more competitive as international marketing of tourism products is enhanced and the consumers are better informed about a wider choice of destinations and their rights and entitlements. These factors coupled with increased concern for environmental protection following the adoption of Agenda 21 for the Travel and Tourism Industry have led to the need for revision of the old policies into new ones to match the changing trends. This is all the more important and necessary given that the tourism sector has been identified as one of the sectors that shall contribute significantly towards poverty alleviation and employment creation as set out in the *Economic Recovery Strategy for Wealth and Employment Creation 2003-2007 and Vision 2030*[8,47].

The reviewed tourism policy will be guided by the following principles: benefit sharing from tourism, reducing leakages of tourism earnings and sustainable development of the tourism products. At the core of these principles is the recognition that Government, communities and the commercial sectors must work together to ensure a sound future for Kenya's tourism industry. The policy focuses on the economic, social, environmental and cultural objectives. These objectives have been translated into a set of national tourism policies and strategies that shall be adopted for consistency in decision making during the implementation of the tourism programme. Implementation of the tourism policies and strategy shall also involve streamlining the tourism policy with wildlife, land-use and other cross-cutting policies, and setting up the necessary legal instruments for providing resources to facilitate development[8, 47].

5. Planning and Management

The development of tourism at the coast involves diverse stakeholders however it is the Government through the Ministry of Tourism which has been responsible for co-coordinating the activities of diverse and different interest groups which are involved in the development of tourism. In this regard the Kenyan

Government has, over the years, played a crucial role in the development of the country's tourism industry[3]. To increase investments in the sector and to boost its foreign exchange the government turned to foreign and multinational tourism investors to provide initial capital for the establishment and development of large-scale tourism, and hospitality facilities. It adopted an, open-door "*laissez faire*" policy towards multinational investors and developers. Thus the Kenyan government has mainly promoted large scale, capital-intensive tourism and hospitality projects such as beach resorts, high rise grand hotels and lodges with foreign and multinational investments[13].This has tended to exclude local participation in tourism project design, planning and management[3].

The development of these capital-intensive tourism and hospitality facilities was not guided by sound environmental principles. This led to the development of tourism and hospitality facilities without consideration of the long-term socio-economic and environmental impacts of the facilities. In consequence, unplanned and haphazard mushrooming of tourism and hospitality facilities in fragile coastal and marine ecosystems has for instance, caused accelerated and severe problems of tourism resource degradation, and reduction of the quality of the tourism product. For example, hotels have been constructed that interfere with delicate marine ecosystems (lagoons, fragile sandy beaches and coral reefs) without taking into consideration the environmental impacts and aesthetic value of the tourism facilities[27].

The locals have borne the cost of tourist development at the coast. Some of the tourism costs incurred by the local people include water pollution as raw sewage from the tourist hotels and lodges drain directly into the local water systems and the disruption of indigenous cultures by mass tourism activities. Also in certain locations prime agricultural land, which could have been otherwise used for local food production and livestock rearing, is used for tourism development and wildlife preservation[3]. Excessive private tourist development is also denying equitable human access to beaches and coastal waters, cutting off local populations from their coastal heritage[2]. The need for a tourism plan was identified in the early 1990s and a National Tourism Master Plan was developed through the assistance of the Japanese International Development Agency (JICA) in 1995. The Plan was, however, not adopted[18].

6. Development, Trade and Projects

Kenya's Poverty Reduction Strategy Program (PRSP) for economic recovery and wealth creation for the period 2003 -2007 had plans for revamping the Tourism sector to contribute to the country's economic growth. In the PRSP, Tourism was seen to play a central role in the Kenyan economy as a major source of potential growth and employment generation. As such, the government was committed to working with the private sector in removing the hindrances to its growth, and strengthening the linkages between tourism and the rest of the economy. To do so, government organizations (Kenya Tourism Board, Wildlife Service, the Tourism Development Corporation and the Hotel & Restaurant Authority) work hand-in-hand with a wide range of representatives from the private sector (Kenya Tourism Foundation, its member groups, and other stakeholders) to develop and implement a coordinated strategy for revamping the sector (tourism development policy and plan). The Strategy was intended to address the need to attract tourists from a wider range of countries, diversifying tourist attractions, expanding the benefits to the local population, protecting the environment, and improving quality and standards[30].
The government strategy was to enhance security in tourist areas and facilities, review the structure of taxation (which currently results in a 22 % average tax on tourist spending), and providing tax incentives for tourism infrastructure refurbishment. To improve marketing of Kenyan destinations, the government strengthened the Kenya Tourist Board, which together with the Ministry of Information and Tourism and the Kenya Wildlife Service embarked on a major promotion campaign and improves information systems[3]. To strengthen the linkages between the tourism sector and the rest of the economy and to make tourism pro-poor the government through The Kenya Tourist Development Corporation (KTDC) has facilitated local investment and providing credit to small and medium enterprises. Community involvement has been strengthened though the fostering of community-based tourism projects,

strengthening community-based wildlife conservation initiatives, offering compensation for damages caused by wildlife and opening up of less- visited parks[30].

For environmental protection, the government, in partnership with the private sector and communities, has now focused on land management. Elements of land management include developing an integrated coastal zone management structure to oversee development on the Kenyan coast. Local communicates will be involved in designing and implementing plans for sustainable land use management as part of the National Environmental Management Act[38]. To address quality and standards, the government has plans to open a new training college and enhance the role of the Catering Levy and Development Trustees (CTLDT) to provide affordable credit to local tourism operators and a regulatory framework for the standardization of training in the sector[30].
The government now takes seriously the importance of empowering local communities in tourism by encouraging local ownership and management of tourism resources, and small and medium enterprise development by implementing the Economic Recovery Strategy for Wealth and Employment Creation[12, 39].

With the decline of tourism from the 1990s and recognizing that local communities have not benefited much from tourism, the government has pursued strategies to revamp the sector and enhance the participation of local communities in tourism development[12, 39].The government has ensured that local tourism operators are facilitated through availing accessible and affordable credit through the Kenyan Tourist Development Corporation (KTDC), the Catering Training Levy and Development Trustee (CTLDT) and Tourism Trust Fund (TTF). A number of community projects have benefited from the government initiative through development of cultural centres (Bombolulu cultural centre in Mombasa and Giriama Cultural village in Malindi), improved marketing of their products (Malindi curio market), upgrading facilities (Mombasa Boat Operators) and development of Tourism plans (Tana Basin). Local community tourism projects and Small and Micro-Enterprises in tourism have been facilitated to forge partnerships and linkages with the dominant tour operators[39]. The government has also promoted the development of local skills to take over the management of tourism enterprises. Since 1996 graduates in tourism have been produced by Moi University[40].They were expected to replace expatriate personnel and to start indigenously-owned tourism enterprises. Despite these initiatives the local coastal people are still engaged in manual jobs as cleaners, watchmen and gardeners [18].

While the growth prospects for coastal tourism in the region are strong, environmentally sensitive and locally beneficial ecotourism products are relatively undeveloped in the coastal market as opposed to the inland, wildlife safari market. The main reason for this relates to relatively weak local land tenure and control over the key natural resources that tourism industry investors seek to access[24].

6.1 Examples of Community Eco-Tourism projects

Project	Location	Donor	Source
Beach Operators boat project	Mombasa Marine Park and Jomo Kenyata Public Beach in Mombasa	Tourism Trust Fund given a grant of Ksh 12.6 million ($195,956.45 USD)	http://www.eturbonews.com/3190/kenya-tourism-trust-fund-gives-a-ksh-126-mill
Mwaluganje Community Elephant Sanctuary	Kwale District – South Coast	USAID, through its Conservation of Biodiverse Resource Areas (COBRA) program, funded Kenya Wildlife Service (KWS) to help the local farming communities establish the reserve on their own land.	http://www.usaid.gov/regions/afr/ss02/kenya5.html
Malindi Curio Market	Malindi	The Government of Kenya through an organization called Micro-Enterprises Support Program (MESP) by funding Ksh 7.4 Million for construction of a showroom.	http://www.bestjobskenya.com/bt-empd-malindihandicrafts.htm
Wasini Island, Woman's Board Walk at Kisite	Kisite – South Coast	USAID initiated support through Kenya Coastal Management Program (KCMP)	USAID, 2006. FORREMS PROGRAM & KCMP. Mid Term Evaluation

7. SWOT Analysis

Strengths	**Weaknesses**
• Variety of tourism products including endemic coastal forests, marine parks and wildlife sanctuaries. • Several well-known luxury beach hotels exist along the coastline of this country. • Potential benefits for communities near protected areas eg Kisite Marine park and Arabuko butterfly projects. • Kenya Wildlife Service has improved and branded national parks and reserves at the coast. • Kenya's coast long standing popular destination since the 1960's • Known to tour operators • Quality wildlife and beaches • Customer awareness • Hospitable friendly people • Excellent all-year climate • No jet lag from Europe • Good tourism training facilities • English speaking	• Lack of data and statistics on benefits, bed occupancy, number employed in the sector • Lack of a national tourism master plan the one developed in 1995 is largely unknown. Kenya's coastal tourism industry has developed largely in the absence of any formal planning processes • Deteriorated infrastructure especially road networks • Insecurity and crime • Mass market image • Perceived as cheap beach destination • 'Tired' hotel infrastructure • Anti-competitive trade practices in the marketing and sales distribution system • Limitations on air access & seat capacity • Beach harassment • Malaria and HIV/AIDS • Entry and visa impediments • Lack of quality control and standards
Opportunities	**Threats**
• Provision in the Environmental Management and Coordination Act, 1999 to develop a spatial coastal integrated plan that is participatory and will include local communities • Existence of Tourism parastatal (CDTF, TTF) and NGOS that support tourism entrepreneurs through funding of community ecotourism projects. • Finalizing the tourism policy and legislation • Kenya's PRSP for economic recovery and wealth creation for the period 2003 -2007 is important for enhancing growth in tourism • Vision 2030 to guide development • Ecological and topographic diversity • Diverse heritage, cultures and traditions • East African co-operation	• Infrastructural deficiencies, static and un-innovative products • Increased regional competition • Unplanned and skewed tourism development, poor employment opportunities for the local people • The quality of coastal tourist attractions is increasingly being reduced. • High poverty rates • Increased rural to urban migration • The time and cost of starting a business is high • Acts of terrorism • Negative travel advisories • Increased competition • Tour operator price pressures • Community envy/resentment • Human-wildlife conflict • Animal poaching • Shortage of future investment capital • Over-reliance on a few major markets • Corruption and bribery

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1. Introduction

Farming Activity	Culture Species	Culture Technology	Production Scale[1]	Annual Production (2008)	Number of Farms	Consumption		
						Export	Domestic	Household
Prawn	Penaeus monodon and P. indicus	Pond culture; polyculture with finfish and / or mud crab	Small-scale experimental	350 kg	4		X	X
Crab	Scylla serrata	Cage and pen culture (fattening); occasional polyculture with prawn and / or finfish	Small-scale experimental	600 kg	6		X 350KSh / kg[1]	X
Finfish – milkfish and mullet	Chanos chanos and Mugil cephalus	Pond culture; polyculture with prawn and / or mud crab	Small-scale experimental	500 kg	8		X	X
Seaweed	Kappaphycus alvareizi Eucheuma denticulatum	Stake and line culture	Small-scale experimental	-	1	X		

[1] 2007 Farm gate price (Mierera, 2007)

2. Biophysical

Farming Activity	Geographical extent	Environmental issues
Prawn	All along the South Coast of Kenya	The major environmental issues relating to prawn culture in Kenya are a product of the alteration / destruction of mangrove habitats to provide space for ponds. In addition, the disposal of high nutrient / suspended solids in the aqueous effluent stream can result in water and sediment quality degeneration in the receiving environment. In some cases, these problems are exacerbated by poor pond husbandry protocols – a consequence of inadequate knowledge of sustainable production technologies.
Crab	All along the South Coast of Kenya	To date, the crablets that are used to supply the crab fattening operations are being harvested from the wild with little concern for the resource status and long term sustainability of the activity. There is a clear need to develop stock assessment / recruitment models that can be used to address sustainability of proposed operations. Currently, the crabs are fattened on trash fish, however as the sectors grow it is likely that this feed source will become limited, thus efforts need to be made to identify alternative feed sources – possibly simple farm made feeds.
Finfish	All along the South Coast of Kenya	Marine finfish farming (milkfish and mullet) in Kenya is largely characterised as extensive, making use of ponds that are dependant on tidal water for exchange. The systems rely on natural foods, minimal fertiliser and low stocking densities, although ponds are constructed on the mangrove inter-tidal sand flats. These are areas of low biodiversity, and usually, no cutting of mangrove trees occurs. Fingerlings are wild caught using nets, with studies indicating supply is reliable twice per year. The use of wild capture fingerlings is unlikely to affect recruitment patterns in the wild stocks. Environmental impacts arising from the activity are likely to be minimal.
Seaweed	Southern Region	Kenya's coastline is characterised by coastal reefs with sharp drop-offs, fringing reefs and mangrove areas. Seaweed farming requires relatively shallow water, and due to the topography of the coastal zone in the Southern Region, many areas with coastal reef do not have large areas of shallow lagoon waters. Fringing reefs are usually utilised for fishing and tourist activities. Mangrove areas are not ideal due to fluctuating salinities and heavy sedimentation. Thus, a major constraint to seaweed culture in Kenya is a lack of suitable conflict-free culture space.

3. Human Environment

Farming Activity	Developmental Paradigm and Livelihood issues
Prawn	Extensive prawn farming in small ponds is simply not economically feasible, and such programmes are almost always unsustainable. The only realistic opportunity for community based prawn farming is at the Ngomeni prawn farm (north of Malindi). However the land tenure situation at Ngomeni is anomalous and needs to be resolved before community based prawn farming could be considered. A lack of knowledge of farming techniques leads to mismanagement and poor water quality. Other issues relate to conflict with other coastal user groups most notably the tourism sector, and theft.
Crab	Mud crab farms have been developed as group or community enterprises. Primary issues arise due to the lack of seed stock combined with the lack of training. Poor training, knowledge (crab biology and culture) and skills often result in poor production, resulting in high mortalities, low quality, insufficient numbers of saleable animals, and low market prices. Often poor production results in a gradual loss of commitment from community members to care for and monitor the project, a situation that is often exacerbated by insufficient monitoring and backstopping from technical extension workers. Other production issues relate to theft and conflict with other coastal user groups - most notably the tourism sector.
Finfish	Small scale pond farms in the inter-tidal areas between mangrove stands have been developed as community based livelihood opportunities. Currently, a lack of policy, legislation and planning to guide the development of the sector has led to some uncertainty regarding the future of some community based initiatives. In terms of production constraints, production is often negatively affected by a lack of formulated feeds to maximise fish growth, poor pond water quality and algal productivity, the seasonal availability of fingerlings that are used to stock the ponds, poor pond siting and the physical failure of the pond systems. Many production facilities are set up as a component of donor programmes and often fail due to a lack of long term financial support. In general, additional farmer skills are required in terms of business and production planning, and additional support is often required in terms of backstopping and extension services. Other issues relate to conflict with other coastal user groups, most notably the tourism sector. In some communities, the theft of market sized fish is problematic.
Seaweed	A feasibility study undertaken by the KMFRI has led to a pilot project involving 300 farmers with the aim of developing coastal commercial seaweed culture. Working together with coastal-based community organizations and multi-national seaweed purchasing farms of Zanzibar, demonstration farms and nurseries have been established for the two strains of seaweed.

4. Policy and Governance

4.1 Policy

Legislation	Present	Comment
Fisheries Act	Yes	The Fisheries Act of 1991 and Maritime Zones Act.
Aquaculture Act	No	Aquaculture in Kenya falls under the jurisdiction of the Fisheries Act of 1991. This act is outdated and does not adequately address the issues pertaining to modern aquaculture.
Aquaculture Policy	No	The fisheries policy, which is being developed, contains an aquaculture component which will guide the development and management of aquaculture in an effective and coordinated manner.
Sub-sector development plans	No	
Aquaculture Masterplan	No	Ministry is developing a strategic plan and master plan for aquaculture.
Aquaculture zoning	No	
Environmental Management Acts	Yes	Environmental Management and Coordination Act of 1999 as administered by the National Environmental Management Authority (NEMA). In terms of developing mariculture operations in the mangrove areas (milkfish, mullet, crab fattening), the Forests Act of 2005 legislates silviculture development, and thus provides the framework for development of activities in the mangrove environment.
EIA Requirements	Yes	An Environmental Impact Assessment (EIA) is required for small and large scale aquaculture operations.

4.2 Governance

The Department of Fisheries (DoF) is mandated by the Fisheries Act to manage and administer the mariculture sector and the responsibility of the Kenyan Marine and Fisheries Research Institute (KMFRI) is to provide research based decision support. Within the DoF, The Directorate of Aquaculture is the responsible agent for the development of the aquaculture sector. The Directorate's core functions include:

- Provision of aquaculture extension services
- Co-ordination of national aquaculture development activities
- Promotion of commercial aquaculture development
- Identification of aquaculture research needs with stakeholders

- Development of human capacity for farmers and extension workers

In contrast, KMFRI's mandate is to conduct aquatic research, and in this regard has developed a dedicated aquaculture research programme focusing on species and technology development, nutrition, improvements to seed supply, fish health and diagnostics, and genetics. The National Environmental Management Authority, a parastatal under the Ministry of Environment and Mineral Resources, is the principal government instrument for the implementation of all government policies relating to the environment. With respect to activities that are undertaken in mangrove areas, developments fall under the jurisdiction of the Forestry Department.

Despite substantial research efforts at KMFRI, past and present mariculture initiatives have primarily been driven by NGOs (Section 6.6). To date, there have been no dedicated NGO programmes that have focused entirely on mariculture development. Rather, mariculture projects have been developed as components of wider NGO ICZM interventions.

5. Planning and Management

A permit is required to develop a mariculture operation. Permits are issued by the DoF. Theoretically the DoF acts as a one-stop shop for permit applications, and the department should expedite the process through the local community, district and finally national departmental structures. According to the Environmental Management Act an Environmental Impact Assessment (EIA) is required for small and large scale aquaculture operations. Currently, there is no active and continuous marine water quality monitoring programme in the coastal zone.

To date, mariculture sector development has been an un-coordinated process with projects being developed in an ad hoc manner. With respect to sectoral development, and in contrast with other countries in the region, there have been no previous bi-lateral support programmes focusing on mariculture development, planning or management in the country.

6. Development, trade and projects

Development Project	NGO / Donor / Private Sector	Project Details
Kwetu Training Centre	British High Commission, German Embassy, Commission for Higher Education, CORDIO	The program focuses on silvofisheries of mud crab, finfish (mullet and milkfish) and prawns with a focus on field research and extension. Since 2004, the project has trained 3 communities in small scale fish / prawn culture technology and a further 2 communities in small scale mud crab culture.
Majaoni Youth Development Group	Kwetu Training Centre	In 2005, a CBO based at Majaoni village and comprising 13 members was created to promote small scale mullet, milkfish and prawn culture. The programme is supported by the Kwetu Training Centre and operates in collaboration with NEMA, DoF and the Forestry Department. It is anticipated that mud crab production is to be included in their activities.
Dabaso Conservation Group	Watamu Turtle Watch, Kwetu Centre, KMFRI WWF-EFN, Rufford grant	The Dabaso conservation group is a CBO comprising 31 members (2007). The group practice mud crab cage farming with technical assistance being provided by KMFRI, Moi University and the Coastal Development Authority (CDA).
Wampare Prawn Farm	Personal Investment	Developed in 1992 as a private sector venture, the Wampare family has established 3ha of prawn ponds. In 2007, the facility employed 1 full time person and 5 casual staff but was not operating at full capacity. Problems related to inadequate technology transfers, poor management protocols, sustainability, and legal issues relating to the operation of the facility.
Baraka Conservation Group	Kwetu Training Centre, CORDIO, group contributions	Registered as a CBO in 2005, the group comprises 25 members, and makes use of mangrove areas for fish (mullet, milkfish and prawn) polyculture, and mud crab cage culture. The group is supported by Kwetu Training Centre and CORDIO, East Africa. A lack of monitoring and on-going technical assistance is currently restricting production.
Abent Youth Group	RAMSAR, KMFRI, CDA, member	A CBO registered in 2001 with 20 members. In 2004, the group was introduced to mud crab farming through training by KMFRI, CDA and

	contribution	Moi University. Inadequate technology transfer, theft, poor monitoring, and a lack of financial support resulted in the project's failure.
Portreiz Fishermen Group	Fisheries Department - "Njaa marufuku" program	Registered as a CBO in 2006, the group had 12 members. The group attempted to develop a crab fattening operation. The project failed due to inadequate technology transfer and the inappropriate siting of the facility.
Wasini Women Group	Royal Embassy of Netherlands, IUCN, USAid, EU-biodiversity conservation project	Registered as a CBO in 1998, the organisation was designed to enhance women's income through enhanced marine resource utilisation and conservation. In 2007, the group comprised 68 women. The group developed the "Kokoni crab farm" under technical assistance from Pact Kenya, KMFRI and Coast Development Authority. The project failed as a result of poor training, technology transfer, and high stock mortalities.
Tsunza Conservation and Development Programme	UNDP, EU, Mangrove action plan, Netherlands Royal Embassy, Swedish Society for Nature Conservation	Set up as a CBO in 1996, the organisation had 150 members by 2007. The CBO focuses on mangrove conservation and in 1999 experimented with crab culture. Two years of pen culture trails resulted in less that 300kg of crab production per annum, and the activity was terminated. The low productivity was attributed to poor project implementation, marketing, seed stock availability, and inadequate technology transfer.

7. SWOT Analysis

Strengths	**Weaknesses**
• High quality seawater • Enthusiasm and dedication of Kwetu • Research support capacity at KMFRI • Willingness of the DoF (Coastal and Marine Branch) to develop the sector • Willingness and eagerness of coastal communities to adopt mariculture • High number of potential candidate species for small (and large) scale mariculture • Development mandate of the Coastal Development Authority (CDA) and their active participation in assisting mariculture groups • Support of silviculture by the Forestry Department	• Absence of a sector plan • The absence of a one stop shop (for applications) • Extension capacity • Access to the coast • Absence of marine fish farming capacity at KMFRI, DoF and CDA (all available fish farming expertise is in fresh water fish culture) • Poor understanding of farm-made feeds • CBO organisational capacity is weak • High soil porosity in coastal zone
Opportunities	**Threats**
• Dedicated government and or bilateral support for mariculture development. • Greater and dedicated NGO involvement. • Expansion of farmer appropriate demonstration facilities at Kwetu. • Hands-on training of trainers and extension agents in Kenya. • Providing support to develop a sector plan	• Hotel strip development. • Land tenure. • Privatisation of state land for tourism development. • High cost of coastal land hence developments are often restricted to communal areas. • Governance constraints. • Theft and vandalism. • Possible water quality problems in creeks (coliform bacteria).

8. Recommendations to Promote Sectoral Development

To date, mariculture development in Kenya has been an uncoordinated process with projects being initiated in an ad hoc manner. The country lacks a developmental framework to guide sectoral development, and in this regard, it would be appropriate for the Department of Fisheries to commission a mariculture sector development plan to guide future interventions in the sector. The plan needs to take

cognisance of the current institutional constraints to development and constraints to specific sub-sectors (e.g crab culture, finfish and prawn polyculture) and identify new opportunities (e.g small scale grouper culture, coral culture). Institutional constraints such as the current lack of extension capacity at the DoF, the need for additional extension capacity and demonstration facilities at Kwetu, and a focused research and development agenda for mariculture development at KMFRI need to be addressed and funded. The policy and regulatory environment needs to be reviewed such that an enabling investor environment is created. Where appropriate, regulations will need to be altered. For example, the current requirement for all mariculture operations to require an EIA irrespective of production volumes needs to be reassessed - such a regulation is likely to deter small scale investors into the sector. In terms of governance, clarity is required in terms of institutional roles and responsibilities. In this regard the role of the Coastal Development Authority (CDA) which has a developmental mandate, and the Departments of Fisheries and Forestry need to be clarified such that institutional responses to development are coordinated, and in this regard, one organisation becomes responsible for coordinating sector development.

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1. Introduction

Agriculture is the mainstay of the Kenyan economy and employs 70 percent of the country's total labour force of over 10 million people, compared to only 3 million people who are employed in the formal sector. It also generates 80 percent of Kenya's export earnings and supplies over 70 percent of raw materials for domestic agro-industry. Overall the agricultural sector contributes more than 45 percent of government revenues. However, agriculture's value-added, as a percentage of growth in GDP, has remained small and declining between the years 2002 and 2006 (Wio-Lab 2008).

Agricultural activities along the Kenyan coast produce both food and non-food products for subsistence and commerce, and traditional shifting cultivation and slash and burn farming practices are widespread. Livestock production contributes significantly to the Kenyan coastal economy, and there are 85 ranches within the Coast Province, 25 of which are operational. Livestock production is mainly concentrated on the marginal land of the coastal region, which accounts for some 69 percent of the total coastal area. For example, the pastoral communities in Tana River District graze large herds of cattle in the lower ridges of the Tana River basin.

The main food crops grown on the Kenyan coast include cassava, sweet potatoes, maize, coconut, cowpeas and rice, which are grown in irrigated areas, marshes and floodplains. Vegetables and tropical fruits such as citrus, mangoes, bananas, pineapples and watermelons are grown for both subsistence and export. Other crops, which are mainly grown for export, include cashews, bixa and sisal. The average farm size on the Kenyan coast is between 6 and 8 ha, and tree crops (cashews, coconuts, citrus and mangoes) occupy about 50 percent of the coastal arable land (Wio-Lab 2008).

Kenya's coastal zone includes closely connected terrestrial and marine environments. It consists of distinctly rich, diverse and productive ecosystems, habitats and resources and includes coastal wetlands, coastal forests, mangrove swamps, coral reefs and tidal flats. These are some of Kenya's most valuable ecosystems and are protected by six national reserves and parks. The coastal zone is essential for the well being of Kenyans, with a large number of Kenyans deriving their livelihoods from the coastal region, and it is also a large contributor to GDP through earnings in the tourism sector. Many coastal economies rely directly on the use or harvest of renewable natural resources from the coastal zone environment including forest products such as timber, and these resources are central to the traditional subsistence lifestyle of many coastal communities.

2. Biophysical

The Coast Province covers approximately 86,000 km^2 and is characterized by four topographical zones (NEMA 2001):

- the coastal plains, which stretch from the sea level to 30m a.s.l.,
- the foot plateau, which stretches from 60m to 140m a.s.l,
- the Coastal range, particularly around Kilifi creek, and
- the Nyika plateau, rising up to 150m a.s.l.

The Coast Province is comprised of seven districts namely Kwale, Taita Taveta, Mombasa, Kilifi, Malindi, Lamu and Tana River which can be seen on Map 1 in Annex 1.

Coastal forests in Kenya are estimated to cover a surface area of about 660 km^2, however, the majority of them are now degraded. According to White (1983) in Wio-Lab (2008), Kenya's coastal forests fall within the northern range of the broad Zanzibar-Inhambane Regional Mosaic, an extensive biogeographical unit stretching from the southern tip of Somalia to the southern coast of Mozambique. Due to its plant endemism, this northern area has more recently been re-classified as the Swahilian Regional Centre of Endemism and the vegetation types are mostly semi-evergreen or evergreen undifferentiated dry forest. Examples of coastal forests in Kenya include Arabuko-Sokoke, Tiwi and Diani Forests. Kenya has lost more than 90 percent of the coastal forest cover that existed in the early nineteenth century. Yet its remaining coastal forests are still unique in their totality as a biodiversity priority site in the world. As fragmented as they are, the Kenyan coastal forests contain unique species that are only found in specific forests. The species diversity is of high value to the communities that live adjacent to these forests and to the world community as a whole (UNDP Kenya 2010).

Other key production sectors in the coastal zone are mangroves, coral reefs and sea grass beds. The area of mangroves in Kenya is estimated at 52,980 ha, spread over 18 forest formations along the coast. Lamu District, with 34,000 ha of mangroves, contains the largest mangrove area. All the nine mangrove species recorded in the Western Indian Ocean region occur in Kenya with the two species of *Rhizophora* and Ceriops being dominant and accounting for 70 percent of total mangroves (Republic of Kenya 2007).

Approximately 12 species of sea grasses have been reported on the Kenyan Coast with some of the most common species being *Thalassodendon ciliatum*, *Halodule wrightii* and *Halophla minor* (Republic of Kenya 2007). Sea grass beds cover a surface are of about 33.6 km^2, with the most important sites in the region lying between Lamu and Kiunga. In the north of Kenya (Kiunga Marine Reserve), 11 species were identified in estuary, bay and reef habitats. However, there has been significant loss of sea grass along the coast, initially attributed to human-related activities, but now also to sea urchin population growth. In Diane-Chale lagoon for instance, preliminary studies indicate that *T. ciliatum* beds experienced a loss of more than 50 percent of cover. These degraded sites were also found to have a density of the sea urchin *Tripneustes gratilla* of more than 37 individuals/m^2, while healthy sites had a density of only 4 individuals/m^2 (Wio-Lab 2008).

The approximate values in November 2008 of the four different coastal production sectors in Kenya's coastal zone are presented in Table 1 below:

Table 1: Valuation of Ecosystem Goods and Services in Kenya

Coral Reefs		Mangroves		Coastal Forests		Sea Grass Beds		Total
Area (km^2)	Value (Million US$)	Area (km^2)	Value (Million US$)	Area (km^2)	Value (Million US$)	Area (km^2)	Value (Million US$)	Value (Million US$)
630	383	500	500	660	133	34	65	1,079

Source: Wio-Lab 2008

3. Human Environment

Kenya's coastal region has a population of about 2.5 million people, of whom 62 percent live below the poverty line; Coast Province is the second poorest of Kenya's eight provinces. About 34 percent of the population resides in urban areas along the coastline, with immigration from rural to urban areas of the

coast increasing and leading to many new immigrants becoming involved in livelihoods that make illegal and unsustainable use of natural resources, which in turn aggravates a vicious cycle of poverty and decline in environmental quality (World Bank 2009).

One of the main underlying causes of environmental degradation along the Kenyan coast is institutional failure in the market system, including via pollution, over-extraction of resources, influential vested interests and inadequate property rights, alongside inappropriate and inconsistent application of government policies. A consequence of this is the undermining of coastal livelihoods, leading to unsustainable resource use patterns which are now common on the Kenyan coast (Republic of Kenya 2007). However, bans on human exploitation in Kenya's coastal zones in the name of environmental protection have also had negative effects for the local communities. For example, the revenue generated from the export of mangrove products in Kenya during the 1950s was ranked third among the sale of different types of national forest products, but the subsequent ban on mangrove exploitation in many parts of the region means such revenue is no longer generated thus resulting in a loss of livelihood to local people (Wio-Lab 2008).

The coastal zone environment and its resources play an important role in the economy of the people but processes of population growth and loss of social and community identities mean that effective and sustainable resource management is increasingly difficult, despite the availability of resources. A particular concern has been the clearing of mangrove areas to reclaim land for other uses such as aquaculture, salt manufacture, agriculture and housing. Over 10,000 ha of mangroves have been lost, which is equivalent to about 20 percent of the remaining total mangrove forest (Coastal Portal 2009). Salt production takes place in the mangrove area north of Malindi at Gongoni and Fundissa, while extensive clearing of mangroves has also occurred in the Ngomeni swamps for the construction of salt pans. Presently, there are eight operational salt works in Kenya, occupying more than 7,922 ha of tidal swamps between Ngomeni and Kurawa, with an estimated 170,000 tonnes of salt produced annually (Wio-Lab 2008). Sea grass beds are also threatened in Kenya by human activities within the coastal zone yet they are important habitats for many species of fish and they act as sediment traps ensuring good health of coral; their preservation is thus important to fishing and tourism components of local livelihoods.

4. Policy and Governance

Inadequate planning and rapid growth have been major factors contributing to the degradation of Kenya's coastal resources, as well as a decline in the importance of traditional livelihood activities based on natural resources and their replacement by other uses of the coastal environment, causing a decline in water quality, erosion of the shorelines, degraded coastal systems and an increase in resource user conflicts. These coastal management problems require the attention of multi-sectoral partners, collaborating to find an integrated solution, and in 1994 this need was recognised by the Coast Development Authority (CDA) who initiated Kenya's first Integrated Coastal Management (ICM) process.

The CDA is as a corporate body under the Ministry of Agriculture and Rural Development, established as an act of parliament (cap 449) in 1990 and inaugurated in 1992. It provides planning, initiating, coordinating and integrating of development activities along Kenya’s coasts (CDA 2001).

The CDA's primary goal can be summarised as “the improvement of the standard of living of all coastal people without impairment of the resource potential” (CDA 2001). These ideals are reflected in the key elements of ICM, which at root is a government process. In Kenya, the ICM process has concentrated on a district strategy for rural development, empowered by the relevant ministries and parastatal agencies in the Coast Province.

The diverse economic activities taking place in Kenya's coastal areas involve various categories of stakeholders. The government plays a significant regulatory role in managing the coastal zone with the ICM process being the responsibility of the government. A multi-sectoral ICM Secretariat has been formed comprising representatives from the Fisheries Department, Kenya Wildlife Services, Mombasa Municipal Council and other government and non-governmental organisations.

Out of these initiatives, The National Environment Management Authority (NEMA) produced the Integrated Coastal Zone Policy (ICZP) to guide the actions and policies related to the use and management of Kenya's coastal zone resources, including their protection and restoration. The vision of this policy is “to ensure a clean and healthy marine and coastal environment that provides sustainable benefits for present and future generations” (Republic of Kenya 2007, p.3) and the goal is “to guide the sustainable management and equitable use of coastal and marine resources in Kenya” (Ibid, p.4).

Key policy issues of particular relevance to the control of mangroves and coastal forests in Kenya are set out in Table 2 below.

Table 2: Policy Issues for Control of Mangroves and Coastal Forests

Critical Ecosystem	Policy Issue	ICZP Responses
Mangrove Forests – 574km long and providing renewable goods and services that are of economic, ecological and environmental value. The area of mangroves is estimated to be 52,980ha spread over 18 forests.	• Uncoordinated management efforts • Undefined land tenure for mangrove areas • Conversion of mangrove areas into other uses • Lack of management plans for rehabilitation and sustainable harvesting of mangroves • Pollution from land and sea sources	• Develop a harmonised legislative and institutional framework for sustained management • Communities living around and deriving benefits from mangroves will be involved in co-management • Enhance mangrove research • All coastal zone mangroves shall be gazetted to enhance sustainable management
Coastal Forests – These coastal forests bear unique species with high drought resilience, high levels of adaptation and endemicity. The reduction and fragmentation of the forests is due to climate change and human factors.	• Human wildlife conflict in forests due to competition for resources • Overexploitation of plant and animal species by local communities • Over reliance on wood based forest products due to lack of access to alternatives • Uncontrolled harvesting from ungazetted forest areas • Inadequate enforcement of existing legislation due to low capacity and inadequate human and financial resources • Uncoordinated management • Research constrained resulting in inadequate ethno-botanical data and information	• Significant coastal forest patches to be conserved and protected for prosperity and endemism • Systems and structures to be developed for local communities to derive maximum livelihood from coastal forests and participate in their sustainable management • Develop a harmonised legislative and institutional framework for sustained management of mangrove ecosystems • Enhance status of key sites, with UNESCO heritage sites declared with the participation of neighbouring communities • Develop opportunities for sources of livelihood for non-consumptive use of the forest • Effective control of wildlife to minimise human wildlife conflict

Source: Republic of Kenya 2007

5. Planning and Management

As well as through the CDA and NEMA, the planning and management of the coastal zone in Kenya has been strengthened by the recent creation of the Ministry of Fisheries Development, which has produced a fisheries and oceans management policy, and by the establishment of the Kenya Maritime Authority and strengthening of the Freshwater, Marine and Coastal Unit of NEMA (UNEP 2009).

The conservation and sustainable use of coastal and marine biodiversity remains one of the most important environmental issues in Kenya due to the high biodiversity and rich productivity and the growing human population in these areas. The complex and diverse natural system of the coastal zone creates diverse opportunities as well as threats for people living along the coast. Integrated Coastal Zone Management (ICZM) offers a potential way forward.

ICZM aims at ensuring current and future generations of coastal stakeholders realise their basic needs and improve their quality of life whilst maintaining diverse and productive coastal ecosystems. ICZM advocates for the sustainable use of coastal resources and recognises that these resources provide food and livelihoods to millions of people and, if well-managed, can offer increased potential for nutritional and social needs. ICZM also recognises that land management in the coastal zone is affected by ownership, distribution and poor planning which has led to most of it being inadequately utilised.

To ensure that the ecological values of the coastal zone are fully integrated into coastal resource use planning and management the strong focus of the Kenyan ICZP is therefore to (Republic of Kenya 2007):

- ensure adequate information on coastal zone values is widely available to the public;
- develop guidelines to minimise impacts of development activities on coastal zones;
- improve coordination and communication with government;
- conserve and manage critical coastal ecosystems and preserve environmentally significant areas;
- improve the knowledge base for sustainable coastal zone management; and
- promote alternative livelihood options to minimise pressure on resources and encourage participatory approaches to resource management and use with enhanced research.

This results in proposed resource management strategies for coastal forests and mangroves as set out in Table 3 below, and broader community-focused resource management, land use and livelihood strategies as set out in Table 4 overleaf.

Table 3: Management Strategies for Control of Mangroves and Coastal Forests

	Problem Statement	Management Strategies
Mangrove Forests	Major obstacles which have prevented rational use: • Lack of community inputs into management efforts • Poverty status of many indigenous coastal communities • Lack of alternative livelihood • Lack of awareness among decision makers and communities about true values of mangroves	• Review roles and responsibilities of agencies and organisations to collaborate frameworks among stakeholders • Identify potential income-generating activities to improve income of local communities whilst conserving mangroves • Management inventory for effective regulation and rehabilitation of degraded areas • Mangrove training, education and awareness programmes • Capacity building for communities for participatory forest management • Develop guidelines for sustainable use of mangrove wetlands • Harmonise policies on land, fisheries, forestry, agriculture and environment for effective management of mangrove ecosystems • Establish resource use conflict resolution mechanisms
Coastal Forests	The reduction of forest cover and subsequent fragmentation of forests have accelerated loss of endemic species. Major threats include encroachment for settlement and farming, illegal logging, human wildlife conflict, deforestation and loss of biodiversity.	• Manage wildlife population to minimise conflicts and discourage encroachment of human population into forest boundaries for settlement and farming • Improve access to alternative energy sources and construction material to reduce reliance on wood-products • Promote farm forestry and agro forestry to provide alternative sources of wood products • Promote non-wood based forest products such as bee-keeping, mushroom farming and eco-tourism for alternative livelihood strategies and sources of income • Promote forest management partnerships with communities, civil society and other stakeholders • Strengthen conservation with gazetting • Increase public awareness on forest values and function to promote conservation and elevate community participation levels • Document and enhance the application of indigenous knowledge in management of coastal forest

Source: Republic of Kenya 2007

Table 4: ICZM Community Issues and Land-Use Management

	Problem Statement	Management Strategies
Coastal Community Issues	Coastal communities remain impoverished due to: • Lack of legal provisions to ensure access to resources • Under-exploitation of some natural resources • Inadequate infrastructure • Limited capacity and competence in resource management among coastal communities leading to unsustainable use of resources	• Provision of alternative income generating activities to enable people to move away from the environmentally degrading activity that they are currently engaged in to multiple alternative income sources. • Poverty alleviation by encouraging alternative means of deriving incomes - promoting proper land use, creating awareness and providing credit to enhance resource exploitation • Restoration of traditional values on sustainable management of natural resources and heritage • Public participation and awareness and strengthened community participation in resource management
Land Use Issues	Poorly managed land has led to low productivity, haphazard developments and environmental degradation	• ICZM put in place control measures such as Land Control Boards • Develop guidelines for development activities • Feasibility studies for waste management and waste water treatment

Source: Republic of Kenya 2007

6. Development, Trade and Projects

A number of different projects are operating in the Kenyan coastal zone and three important projects are highlighted in this section, covering forests and broader livelihoods development.

Improved Conservation and Governance for Kenya Coastal Forest Protected Area System

This project, originally operating in Kwale District, is piloting better practices to help conserve forest resources for improved livelihoods that are now being used to replicate lessons learned into other coastal Kenyan districts and across Kenya in general. The government, local communities and key partners in Kwale have played a key role in the success of project initiatives which are being coordinated by WWF in partnership with the government and key players in the district. The government has provided a good environment for implementation of this project and it has benefited from strong partnership. This project is half-way through its implementation. This project's experience is also contributing to initiatives that will help communities adapt to impacts of climate change (UNDP Kenya 2010). Table 5 provides some further details of this project

Table 5: Aspects of Project Implementation

Funding	Project Initiatives	Community Involvement
GEF through UNDP has provided funding. Matching funding has been provided by WWF, LAFARGE-Bamburi Cement, Colobus Trust and the Ford Foundation. This is an evidence of commitment and good partnership which has supported communities in Kwale in implementing project activities. The total project budget is USD 3,090,000 both in kind and cash contributions. GEF through UNDP is providing USD 800,000.	The project initiatives cover the original Kwale district (now subdivided into Kwale, Kinango and Msambweni), and support conservation activities with a focus on improving livelihoods. There are several project initiatives under the **livelihood** component including: • Renewable and efficient energy technologies • Ecotourism • Beekeeping • aloe and neem products • village bank • CSO support • Youth group tour guide support for Shimba Hills and handicraft.	Regarding forest conservation there is community participation in forest management. This has been due to the strong project team composed of the key managing institutions for the three forest type present in the area. These are: • Kenya Forest Service for the forest reserves • Kenya Wildlife Service for the Large Shimba Hills Nature Reserve • National Museums of Kenya for the Kaya forests and • WWF as a secretariat for the project. The forest landscape restoration initiative has been successful and communities have been very instrumental in planting useful trees and shrubs in their lands as a way to reduce pressure on the existing natural forests. More than 1.5 million seedlings of 50 different species have been planted in the project area. These included the useful trees and shrubs that are natural in Kwale. Other fast growing commercial tree species have also been grown for income generation and wood fuel. Community participation and awareness has already reduced the unsustainable use of forest products including illegal timber harvesting and incidences of forest fires.

Source: UNDP Kenya 2010

Kenya Coastal Development Project

This project has been designed to provide inputs into three coastal ecosystems including management of offshore fisheries, management of coastal marine environments and support for alternative livelihoods in the coastal zone (World Bank 2009a, 2009b). Regarding the latter, poverty is a seen as a major driver of unsustainable resource use, hence the project supports improved and more sustainable resource use by helping to develop alternative livelihoods. It is planned that activities will be focused in all areas in all coastal districts with implementation being tranched, with a pilot area set up before rolling the project out to all coastal districts. Activities planned that are most relevant to agriculture and forestry include:

- Development of a locally based, participatory, spatial planning process

- Support to establishment of micro, small and medium size enterprises (MSMEs), to help them take advantage of alternative livelihood opportunities
- Establishment of a Coastal Community Action Fund (CCAF)
- Improve availability and affordability of finance available to coastal MSMEs.

The ICT Livelihood Project

This project seeks to alleviate poverty in the Kenyan coastal villages through an integrated approach (Spider 2010). The two main partners in the project, CORDIO and SDMRI, have worked for over a decade on coastal and marine research, conservation and management. In this project they focus on reducing poverty among coastal villages by improving livelihood activities in women's groups. The project has worked with 10 groups of 255 members with the most common activity being poultry farming, with individual groups also interested in mangrove conservation and a tourism walkway, small scale businesses, and agricultural activities such as bee-keeping, goat keeping and gardening.

Starting from very basic levels of organisation the project has also provided groups with mobile pay-phones to use for communication and additional income generation, a computer with internet connection and basic training in these technologies. Next steps include building up adult education opportunities, using the Swedish Folkbildning model, and a focus on environmental education.

7. SWOT Analysis

Strengths	**Weaknesses**
• Subsistence agriculture supporting coastal livelihoods (e.g. crop farming cassava, sweet potatoes, maize, coconut, cowpeas, rice, citrus, mangoes, bananas, pineapples, watermelons) • Cash crop farming (mainly for export) providing income from crops including cashews, bixa and sisal as well as fruits and vegetables • Coastal forests and mangroves providing a wide range of useful resources (timber and non-timber) • Wide recognition that coastal forests are important to livelihoods in coastal communities, and recognition of the strength of coastal agriculture • Evidence of positive planning, management and policy moves to strengthen community capacity and achieve participatory resource management in coastal areas	• Ongoing forest depletion and unsustainable natural resource use weakening the natural resource base and worsening the already existing coastal poverty levels, which fuels the unsustainable resource use • Continuing population pressure putting further strain on resources (Kenya has high population growth rate, fuelled by rural-urban migration in the coastal zone worsening pressure on resources in coastal towns and centres) • Predominance of marginal lands in coastal region limits the scope for further agricultural expansion
Opportunities	**Threats**
• Integrated Coastal Management Policy (ICMP) in place and offering potential for constructive and participatory way forward in improving resource management and livelihoods development in the coastal region • Lots of interest in supporting projects from big donors like the World Bank and UNEP-GEF means there is not a lack of funds going into sector, and alternative income-generating activities (i.e. activities not dependent on coastal resources) are integral parts of these projects • Predominance of marginal lands in coastal region offers scope for further development of livestock production e.g. on the 60 ranches in the area which are not presently operational	• Current political turmoil and volatility could impact on coastal development through broader impact on Kenya's economic growth and overall ability to expand exports and develop further • Relatedly, government policies at high level are in place but there may not be the will or capacity to implement them at local levels given endemic corruption in the Kenyan system

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9. List of Datasets

None found.

10. List of Sector-Related Projects

ICT Livelihoods Project (see Section 6 above)

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Improved Conservation and Governance in Kwale District (see section 6 above)

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Kenya Coastal Development Project, World Bank (see Section 6 above)

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http://www.livestock.go.ke/index.php?option=com_content&view=article&id=73:-the-national-agriculture-and-livestock-extension-programme-nalep&catid=46:projects and

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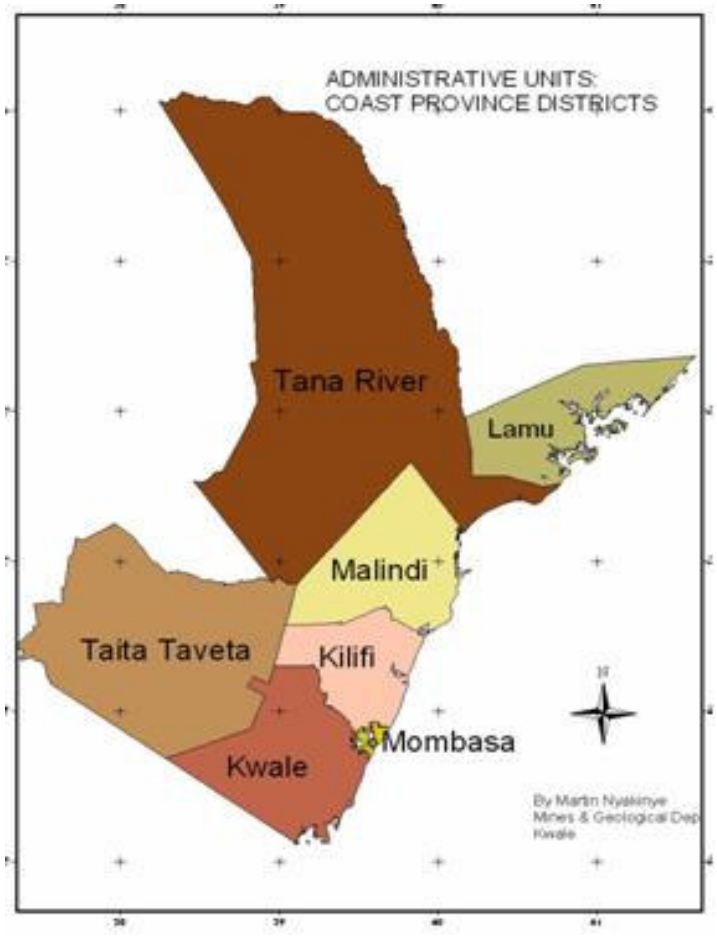
Annex 1 – Map 1 – Kenya's Seven Coastal Districts



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V. Energy – Prepared by Mr. Francois Busson, E-mail: rafrabus@free.fr

1. Introduction

The Republic of Kenya lies astride the equator in Eastern Africa between Somalia and Tanzania and borders the Indian Ocean. With a total area of 582,650 square kilometres, Kenya has 536 kilometers of coastline on the Indian Ocean and the country is bounded by Ethiopia, Somalia, Sudan, Tanzania and Uganda. The official languages of Kenya are Swahili and English; many indigenous languages are also spoken.

The colonial history of Kenya dates from the establishment of a German protectorate over the Sultan of Zanzibar's coastal possessions in 1885, followed by the arrival of the Imperial British East Africa Company in 1888. Germany handed its coastal holdings to Britain and Kenya became a colony in 1890. Kenya became independent on December 12, 1963, and the next year became a republic and joined the Commonwealth.

Kenya is a presidential representative democratic republic, whereby the President is both the head of state and head of government, and of a multi-party system. Executive power is exercised by the government. Legislative power is vested in both the government and the National Assembly. The Judiciary is independent of the executive and the legislature. The legal system of Kenya is based on the Kenyan statutory law, the Kenyan and English common law, the tribal law, and Islamic law.

Kenya is a fairly developed and industrialized country, with services accounting for more than 50% of its GDP. Tourism and agriculture are the dominant economic sectors in Kenya.

1.1 Oil and Gas Sector Overview

Oil & Gas sector is a capital-intensive sector usually divided in two sub-sectors:

- Upstream activities with exploration and production. The Prospecting phase, the drilling and operating the well are capital-intensive and specialized activities, executed by specialized corporations. Decision of exploiting a field mainly relies on the calculated exploitation costs, price of oil, the political stability of the concerned country, and vulnerability to natural hazards. There may be delays between the Exploration and Operating phase when the owner of exploitation rights want to wait for more favourable conditions.

- Downstream activities include all the steps from refining to distribution and marketing. A refinery or a processing plant is also built by specialized corporations, but can use some local workforce. According to countries legislation, distribution is implemented and managed by the State or private firms, but relies more widely on local workforce.

Oil and Gas is not yet a major sector in Kenya, and its contribution to GDP is not detailed in the national accounts.

To date, there has been no evidence of exploitable petroleum reserves in Kenya. However, there are good prospects for new oil and gas fields. Inland, the discoveries made in Uganda raise hopes, and a Chinese company operating in northern Kenya recently hit a “very high concentration of gas”, and is drilling deeper, expecting an oil discovery. Offshore, the coast of Kenya is considered “priority 1” (1)

for prospecting. The Kenyan government is encouraging foreign interest in oil exploration under the coordination of the National Oil Corporation of Kenya Limited .

There is a modest upstream oil industry with a refinery in Mombassa, and this port is also considered as the gateway to the "northern corridor" (according to East African Community terminology) (2), covering the supply of Kenya, Uganda, Rwanda, Burundi, Eastern DRC and Southern Soudan. Thus, the capacities of Mombassa port for oil and gas storage, and transportation to the landlocked countries (pipelines, road, rail) have a regional strategic importance.

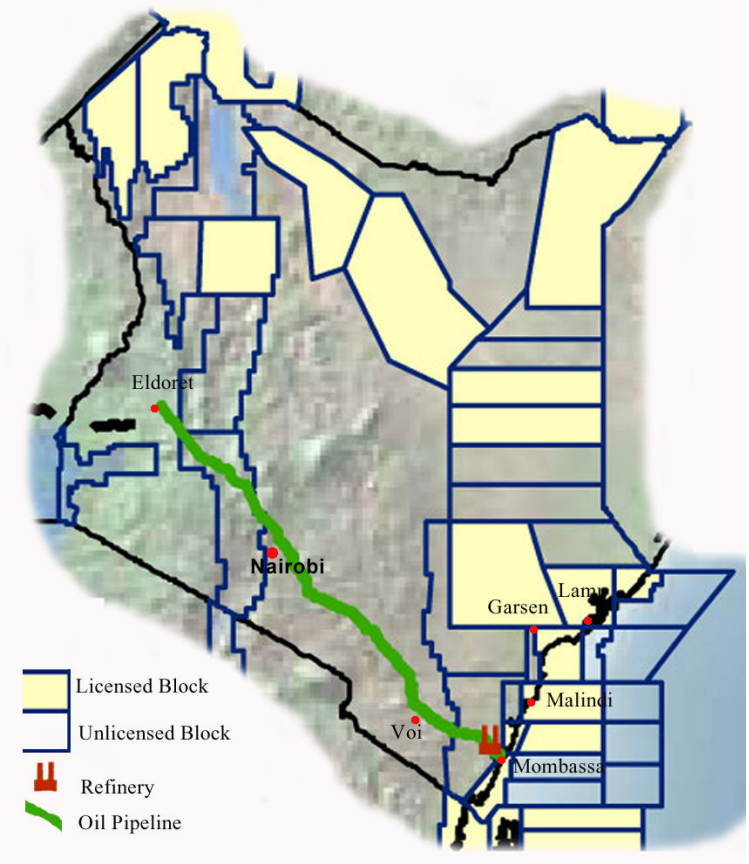

Figure 1. Map of the Oil & Gas activities in Kenya (*adapted from Deloite 2009*)

Table 1. Activities and "key players" in the Kenyan Oil and Gas sector

Activity / infrastructure	Company name	Company structure	Location	Production (per year) / storage capacity	Status / programmed development	Comments
Refinery	Kenya Petroleum Refineries Limited	50% GoK 50% private (Essar)	Mombassa	Processing capacity of 2.7 million mt/yr	Upgrade of the refinery (built in the 60's) planned	"simple" refinery Lack of bulk handling facilities in Mombassa port limits the amount of oil imported
Storage	Kenya Petroleum Refineries Limited	50% GoK 50% private (Essar)	Mombassa	520,022 m3		
Storage	Kenya Pipeline Company Limited	100% GoK	Mombasa Kipevu Oil Storage Facility	300,000 m3		
Storage		private	Mombassa	170,525 m3		
Storage	Kenya Pipeline Company Limited	100% GoK	Nairobi, Nakuru, Kisumu Eldoret Nairo. Airp. Momb. Airp.	97,000 m3 31,000 m3 39,000 m3 42,000 m3 54,000 m3 6,800 m3		
Transport	Kenya Pipeline Company Limited	100% GoK	Pipelines from Monbassa to Nairobi	14 inches diameter for Mombassa / Nairobi (450		

			and western cities	Km) Capacity 440 m3 / hour		
Transport	Kenya Railways Corporation	GoK				Rift valley Railways (Kenya / Uganda) is to improve the infratsructure
Retail	National Oil Corporation of Kenya	100% GoK		Owns over sixty seven stations	In the process of bidding for some of the Chevron stations	Also coordinate oil exploitation
Offshore exploration	EAX, DGAK & Anadarko, Origin/Pacon, Gippsland/Pacon, Sohi-Gas Lamu, Sohi-Gas Dodon	Private				

Prior to liberalization in October 1994, seven marketing and distribution companies were responsible for procuring and importing their own oil. The National Oil Corporation of Kenya was mandated to supply 30% of the crude oil requirement into the country. Since then, many new companies have been licensed by the government to engage in petroleum trading, especially import and export, wholesale and retail of petroleum products. However, only about ten new entrants are active.

The Kenya Petroleum Refineries Limited, Kenya Pipeline Company Limited, National Oil Corporation of Kenya and Kenya Railways Corporation represent the governments presence in the petroleum industry. The Kenya Petroleum Refineries Limited is owned on a 50:50 equity holding between the government and the Indian company Essar. The Kenya Pipeline Company Limited, Kenya Railways Corporation and private transporters are involved in transportation of petroleum products from Mombasa to other parts of the country and neighbouring countries.

The National Oil Company of Kenya (NOCK) has made 17 blocks available for petroleum rights negotiations. The blocks are in the East African Rift System, the Anza Graben, the Mandera Basin, and the Lamu Embayment. The blocks are mainly onshore with the exception of the Southern Lamu Embayment which offers both onshore and offshore blocks.

To date, there is no production of gas in Kenya, nor confirmed reserves. LPG (Liquefied Petroleum Gas, produced when refining petroleum) is not commonly used, only in some urban areas.

1.2 Biofuels

The biofuels sub sector is still in its early stages of development in Kenya. A first attempt with bioethanol has been made in the 80's, but was abandoned due to unsustainable pricing.

But the Kenyan "vision 2030" (3) clearly seeks to develop clean energies, and a Strategy for the Development of the Biodiesel Industry in Kenya (2008-2012) has been produced, with the support of the Kenyan Biodiesel Association (KBDA), bringing together actors from across the value chain.

However, field experiences as in the Tana delta project concerning sugarcane monoculture (4), or the Jatropha Integrated Energy Project (JIEP) in Coast Province (Lamu District) (5) raise strong concerns regarding environmental and social issues.

1.3 Trends and Prospects

The coastal issues for Kenya's oil and gas sector can't be seen only at the national level. Offshore oil and gas exploitation could bring new issues, but growing regional demand for oil and gas products is already absolutely certain.

East Africa, with only one refinery, has the lowest distribution of refineries in Africa. The Kenya Petroleum Refineries Limited (KPRL) is the only refinery in East Africa. It has an installed capacity of 3.2 million tonnes per year (70,000 bpd) but currently processes 1.6 million tonnes per year against a regional demand of 5.7 million tonnes. It also produces 30,000 tonnes of LPG annually, compared to an estimated regional demand of 62,000 tonnes.

There are initiatives underway to develop and upgrade Mombassa port, the national refinery, the storage system (initially in Mombassa), and the transportation system. Mombassa is therefore the main "hotspot" of the oil and gas sector in the coastal zone of Kenya, with the existence of both the risks of increased pollution and opportunities of increased employment and development of services.

It should be noted that the development of Kisumu and Lamu ports are two other development prospects of oil and gas activities in the coastal area (6).

2. Biophysical

As for most African countries, oil and gas are not the main sources of energy for the Kenyan population. Biomass, and mainly wood is the most widely used source of fuel. Greenhouse gas emissions are low, especially when considered per capita.

Table 2. National data on energy consumption and impacts of climate change

Energy use (kt of oil equivalent)	Combustible renewables and waste (% of total energy)	Fossil fuel energy consumption (% of total)	CO2 emissions (kt)	CO2 emissions (metric tons per capita)
18,167	**72.68**	**21.01**	**12,142.50**	**0.33**

Source : World Bank, year 2008

Despite no available specific statistics, coastal populations are not likely to have to display different oil and gas consumption patterns as compared to the country as a whole. However, as seen above, the oil and gas sector relies greatly on maritime transportation, and ports (mainly Mombassa in Kenya's case) constitute a "hot spot" of activities for the sector. Among the seven districts of the Coast Province, Mombassa is therefore the most impacted by oil and gas activities.

Table 3. Environmental and social issues of oil, gas and biofuel activities in the coastal zone

Coastal Oil & Gas Activity	Environmental issues	Social issues
Offshore exploration	• Oil spills, accidents	• Restrictions for fishing zones • Opportunities of employment
Oil & Gas transport	• Oil spills, accidents • Water and soil contamination • Invasive species in ballast waters	• Risks of accidents (fire, collision) • Improvement of transportation network
Mombassa refinery	• Oil spills, accidents • Water and soil contamination • Air pollution	• External workers increase risk of AIDS spreading • Opportunities of employment • Opportunities of new services (education, health)
Gas stations and retail	• Oil spills, accidents • Water and soil contamination	• Opportunities of employment • Opportunities of new services • Fuel availability
Biofuels development	• Swamp drainage • Monoculture and biodiversity loss • Pollution	• Opportunities of employment • Opportunities of new services • Competition for arable land

No major oil spills have been reported in Kenya. The most noticeable pollution incident involved the puncture of a shore tank in 1988 spilling 5,000 tonnes of fuel oil into a mangrove creek (7).

But the coastal environment is at risk from maritime transportation activities at the port and shipping along the coastline. It is estimated that at any given time there are 50 ships in the major shipping lanes off the Kenya coast, approximately 9 are oil tankers with capacities ranging from 50000-250000 tons (8)

3. Human Environment

3.1 Socio-economic Indicators

Table 4. National economic indicators

GDP (million current US$)	GDP growth (annual %)	GDP per capita (current US$)	GDP per capita growth (annual %)	GINI Index (2007)
30,355	**1.69**	**783.04**	**-0.96**	**47.7**

Source : World Bank, year 2008, and HDI

Table 5. National social indicators

Population, total (million)	Population growth (annual %)	Poverty headcount ratio at $1.25 a day (PPP) (% of population)	Human poverty index (HPI-1)	Human development index
38.77	**2.64**	**19.72**	**29.5**	**0.541**

Source : World Bank, year 2008, and HDI, year 2005

Table 6. National gender indicators

Life expectancy at birth, female (years)	Life expectancy at birth, male (years)	Literacy rate, adult female (% of females ages 15 and above)	Literacy rate, adult male (% of males ages 15 and above)	Gender-related development index (GDI)
54,66	**53,84**	**82,8**	**90,3**	**0,538**

Source : World Bank, year 2008, and HDI, year 2005

Kenya's coastal region has a population of about 2.5 million people, of whom 62 percent live below the poverty line; Coast Province is the second poorest of Kenya's eight provinces. About 34 percent of the population resides in urban areas along the coastline, with immigration from rural to urban areas of the coast increasing and leading to many new immigrants becoming involved in livelihoods that make illegal

and unsustainable use of natural resources, which in turn aggravates a vicious cycle of poverty and decline in environmental quality (World Bank 2009).

Mombasa District, which is the most densely populated, has a density of 280 persons per km2 while Lamu District is the least populated with a density of less than 10 persons per km2.

As said above, upstream activities of the oil and gas sector are very specialized. Experts and builders are not locally hired, and only few non specialized jobs are available for the local population.
Downstream activities are more prone to bring some job opportunities locally. Refineries, processing plants, transports use skilled and "semi skilled" workers and proper training can be given with more permanent activities. Trading and retail gas stations create opportunities for SMEs but create a few jobs.
But, like other big mining or industrial projects, oil and gas activities may generate local immigration flows with negative consequences : spreading of HIV and STDs, local inflation from raising goods demand, competition with local population for job access.
Revenue leakages are generally very high since local complementary sectors are not developed, and Governments often unable to help the private sector benefit from this demand.
The main threat pertaining to Medium and Large Foreign Direct Investment addressed by the Government is the eviction effect and the Dutch disease

No available data was accessed to assist in assessing the importance of oil and gas activities on coastal livelihood in Kenya. However, details of the corporate and social responsibility programmes developed by each of the main companies working in this sector provide some information of benefits accruing to local communities.

3.2 Details of corporate and social responsibility programmes of the oil and gas companies

Coastal Oil & Gas Activity	Corporate and social responsibility (CSR) – or Social benefits
KPRL	The company undertakes various activities involving communities around the refinery and beyond as part of its Corporate Social Responsibility agenda, as : • As part of its CSR programmes, KPRL has always endeavoured to promote health and address environmental concerns within its neighbourhood. • This year, KPRL reacted to an appeal by the community board of Miritini Community Municipal clinic and donated drugs worth Ksh 30, 000 and three mahogany clinic tables. • All new persons to the refinery must receive a safety induction before commencing work • There is an onsite dispensary and fire station fully equipped with three fire engines and an ambulance
ESSAR	According to Essar the company is committed to sustainable business practices. Their HSE (Health, Safety and Environment) management system is on par with global standards. They are also taking climate change initiatives to reduce their carbon footprint. This includes several CDM (Clean Development Mechanism) projects that can earn the company CER (Certified Emission Reduction) credits. A growing number of their businesses are certified to international environment standards, like ISO 9001 / 14001, and health and safety standards, like OHSAS 18001.

4. Policy and Governance

Sessional Paper No. 4 of 2004 on Energy Policy was put in place and a new sector legal framework; the Energy Act, 2006, enacted to operationalise the policy framework. Further, the Energy Regulatory Commission was established as a single sector regulator for the energy sector and an Energy Tribunal set up to arbitrate disputes in the sector. A Rural Electrification Policy was also developed to enhance the implementation of the Rural Electrification Programme.

The Minister for Energy is responsible for formulation of policies and laws relating to the energy sector. The Energy Regulatory Commission is the regulator, while the Energy Tribunal is responsible for dispute resolution.

The Environmental and Management Co-ordination Act, 1999, details environmental regulations (Environmental Impact Assessment and Audit)
The Physical Planning Act, (1996 rev. 2009), aims at controlling development at national and regional scales.

The need for a comprehensive National Spatial Plan is recommended under agriculture, manufacturing, urbanisation, and environmental management, which are priority sectors under Vision 2030. In 2008, work started on the preparation of the First National Spatial Plan for Kenya to guide physical development activities over the next 50 years. In addition, it will provide a spatial illustration of all

national projects, identify a strategy for land development and address issues such as settlement, environment, transport and economic development. This will form a critical basis for appropriate deployment of infrastructure in support of Vision 2030 objectives.

The Coast Development Authority (CDA) is a corporate body under the Ministry of Agriculture and Rural Development, established as an act of parliament (cap 449) in 1990 and inaugurated in 1992. It provides planning, initiating, coordinating and integrating of development activities along Kenya's coasts (9). It initiated Kenya's first Integrated Coastal Management (ICM) process, produced by the National Environment Management Authority (NEMA)

The Kenya Maritime Authority works with the Freshwater, Marine and Coastal Unit of NEMA

4.1 Policy and Legislation

Strategies / Regulations	Description - Comments
Energy sector	• Energy Act No. 12 of 2006 encompasses the petroleum and natural gas, electrical energy and renewable energy sectors • National Energy Policy of 2004 • Upstream petroleum activities are governed by the Petroleum Exploration and Production Act, (1982)
Agriculture and land planning	• Strategy for Revitalizing Agriculture (2006). • National policy for the sustainable development of arid and semi arid lands of Kenya.(2005) • Strategy for the Development of the Biodiesel Industry in Kenya (2008-2012) • Act No 295 related to land acquisition • Land Planning Act, No 303
Environmental regulations	• Environmental Management and Coordination Act No 8 of 1999 • Environmental Impact Assessment and Audit Regulations, 2003 • The Environmental Impact Assessment Guidelines, 2004 • The water Quality Regulations, 2006 (Legal notice No. 121). • The Waste Management Regulations, 2006 (Legal Notice No.121) • The Controlled Substances Regulations, 2007 (Legal Notice No.73 of 2007)

4.2 Governance

Entity	Responsibility/ Description
Ministry of Energy	To facilitate provision of clean, sustainable, affordable reliable and secure energy for national development while protecting the environment. **Institutional Framework (SEA refineries…)** The role of the Ministry of Energy in the upstream petroleum industry is to facilitate other actors by creating the appropriate policy and regulatory environment towards promoting exploration and exploitation of petroleum. The National Oil Corporation of Kenya (NOCK) is a wholly government owned company
Ministry of Land	Formulate and implement land policy, undertake physical planning, register land transactions, undertake land surveys and mapping, land adjudication and settlement, land valuation and administration of state and trust land. Responsible for the development of the National Spatial Plan (still in its early stages)
Ministry of Environment, Natural Resources and Wildlife	The Ministry of Environment & Natural Resources is charged with the responsibility of Environmental Policy, Environmental Impact, Assessments and Coordination Development of Forests, Reforestation and Agro forestry, Catchments Area Conservation,
National Environment Management Authority (NEMA)	The National Environment Management Authority (NEMA) is established under the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, as the principal instrument of government in the implementation of all policies relating to the environment.
National Oil Corporation of Kenya	• Overseeing the fulfilment of petroleum exploration companies' obligations in accordance with contracts signed with the Kenya Government. • Providing and disseminating exploration data from various exploration activities in

	form of reports and promoting the same to oil companies in order to attract them to do exploration in Kenya. • Undertaking various exploration works in various basins in accordance with available capital outlay, technical expertise and equipment available. • To manage on behalf of the government storage and disposal of government's share of oil after discovery • Should take control of a considerable share of the market so that it can have an influence on fuel prices for the benefit of consumers
Energy Regulatory Commission	Energy Regulatory Commission (ERC) was established as an Energy Sector Regulator under the Energy Act, 2006 in July 2007. ERC is a single sector regulatory agency, with responsibility for economic and technical regulation of electric power, renewable energy, and downstream petroleum sub-sectors, including tariff setting and review, licensing, enforcement, dispute settlement and approval of power purchase and network service contracts.
Kenya Maritime authority	The statutes that guide the operations of Kenya Maritime Authority are the KMA Act 2006 and the Merchant Shipping Act, 2009 which came into effect on 1st September 2009. Its mandate is to regulate, co-ordinate and oversee maritime affairs through ensuring safety of lives, security of ships and port facilities and protection of marine environment using best practices in compliance with national laws and international conventions, for the socio-economic benefit of stakeholders.
Coast Development Authority (CDA)	The Coast Development Authority (CDA) is Kenya's Regional Development Authority. It is created by the CAP 449 related to the "Coast Development Authority". Its area of jurisdiction is within the coastal belt, covering all the 13 districts of the Coast Province. The authority's operational area has a total population of about 3 million people.
Kenya Ports Authority (KPA),	Under the Kenya Ports Authority Act, has the responsibility for controlling pollution in the territorial waters of Kenya. In fulfilment of this

	responsibility, the KPA, together with representatives of the oil industry (through the Oil spill Mutual Aid Group : OSMAG) , the oil refinery, the shipping industry and bunkering services, has set up the National Oil Spill Response Committee (NOSRC) which has developed a National Oil Spill Response Contingency Plan

5. Planning and Management

Policy Planning Initiative	Objective
Kenya Vision 2030	Backbone of Kenya development strategy, produced in 2007, for a "competitive and prosperous nation with high quality of life by 2030". Social issues and better governance are important pillars of this strategy. The energy sector is mainly quoted for increasing electricity availability and development of renewable energy sources
Poverty Reduction Strategy Paper Kenya (2005)	This investment programme presents a set of priorities of government actions designed to meet the medium-term objectives of the Economic Recovery Strategy. The ERS presents a multifaceted strategy to meet economic growth, equity and poverty reduction, and governance objectives.
PRSP 2010 / First medium term plan 2008-2012 of "vision 2030"	Land reform (concerning agrofuels development) is clearly quoted, but not energy sector
National Spatial Plan	To guide physical development activities over the next 50 years. In addition, it will provide a spatial illustration of all national projects, identify a strategy for land development and address issues such as settlement, environment, transport and economic development. This will form a critical basis for appropriate deployment of infrastructure in support of Vision 2030 objectives

Natural Resource Management Programme (NRMP)	The program will support strategies and annual work plans of the participating institutions; hence, the monitoring system will be fully integrated into the monitoring systems and procedures of the institutions. However, support will be available to upgrade and capacitate this important function in Ministry of Environment & Mineral Resources (MEMR), NEMA and OPM.
Environmental sensitivity atlas for coastal area of Kenya (Kensea)	Atlas produced in 2006 as a tool for oil spill contingency plans and integrated coastal zone management

Table 6. Potential availability of land (all areas in 1,000 Ha) From World Bank, 2010, "Rising Global Interest in Farmland : can it be sustainable and equitable benefits ?" (10)

Total area	**Forest area**	**Cultivated area**	**Suitable non cropped, non protected**			
			Forest	**Non-forest with pop. Density of**		
			< 25/km²	**< 25/km²**	**< 10/km²**	**< 5/km²**
58,511	3,284	4,658	655	4,615	2,041	935

6. Development, Trade and Projects

Development project	NGO / Donor / Private Sector	Project details
Regional Coastal Management (ReCoMap)	European Union	ReCoMap is a regional programme for the sustainable management of the coastal zones of the countries of the Indian Ocean. It is an initiative of the Indian Ocean Commission which deals with seven countries of the region, namely Mauritius, the Seychelles, Madagascar, the Comoros Islands, Kenya, Tanzania and Somalia. The programme started in August 2006 and will end in 2011. The Programme aims at the improved valorisation and sustainable management of coastal resources of the seven countries of the region.
Kenya Coastal Development Project	World Bank	The development objective of the Coastal Development Project is to promote an environmentally sustainable management of Kenya's coastal and marine resources by strengthening the capacity of existing relevant government agencies and by enhancing the capacity of rural micro, small and medium-sized enterprises in selected coastal communities.
Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project	GEF	Concerned countries : South Africa, Mozambique, Tanzania, Comoros, Madagascar, Mauritius, Seychelles and the Reunion Island. All countries are required to have a NOSRCP to provide a national framework for responding to oil spills and protecting the coastal resources
Arabuko-Sokoke Forest Management and Conservation Project	Kenya Wildlife Service, Kenya Forestry Research Institute and National Museum of Kenya	The aim of the project is to enhance conservation of Arabuko-Sokoke's biodiversity and ecological functions, as well as the socio-economic and cultural values. The broad components of the project are: natural forest management and conservation; rural development; visitor and conservation education and training, monitoring and evaluation.
Coastal Areas Management	UNDP	To support coastal development and management in Kenya

7. SWOT Analysis

Strengths	**Weaknesses**
• Clear willingness of building up a comprehensive development framework based on "vision 2030" • Social and environmental issues are among top priority in "Vision 2030". • Strong environmental regulation • Government supports oil exploration • Strong development strategy papers	• Governance, law enforcement and equity are major sectors to be improved as outlined by "vision 2030" • Oil and Gas sector is not a priority in "Vision 2003, nor biofuels development and industrial crops framework (PSRP 2010)
Opportunities	**Threats**
• Oil and gas sector development could generate employment • Oil and gas activities are implemented by large companies generally engaged in corporate social responsibility • ICZM to be made operational soon	• Increase in oil operations (drilling, exploitation, transport, processing, storage,…) shall increase oil spill risks. • Private companies from emerging countries are not always respectful of environmental and social regulations • Investors in biofuel sector seek for the best locations (fertile lands, available workforce, good transportation networks,…) and are not attracted by "marginal lands"

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1. Introduction

The coastline of Kenya stretches approximately 500 km and is fairly regular with few deep bays or river estuaries. The coastal plain is narrow in the south, rising all the way to Nairobi, but further north is a broad low-lying plain rising gradually to the level of the Great Lakes. The main ports are Mombasa in the south and Malindi and Lamu in the north; smaller fishing ports exist at Kilifi and Shimoni. The main activities in the coastal areas outside the city of Mombasa (population 800,000) are farming (sugarcane, cassava, millet, fruits and maize), fishing and tourism.

2. Extent of Ports and Transport Activities

Mombasa

The only international port of Kenya is Mombasa, located within the deep Kilindini Bay reached by a narrow entrance channel along which shallow draft and sandbanks make navigation difficult. The design work to dredge the channel up to 15 metres draft and to widen the turning basins has been completed and is at tendering level. This, upon completion, will accommodate the new generation of bigger vessels and increase the port's competitiveness. The port is managed by the Kenya Ports Authority. Port throughput grew by 2.8 per cent from 15.96 million tons in 2007 to 16.41 million tons in 2008, mainly due to improved efficiency from improved equipment and management as well as the introduction of 24-hour services seven days per week. Transit traffic grew 10.2% from 4.4 million tons in 2007 to 4.87 million tons in 2008.

The new port control tower has modern maritime communication equipment including the Vessel Traffic Management System (VTMS) aimed at monitoring movements of vessels within the harbour, the Global Maritime Distress Signalling System (GMDSS), and Closed Circuit Television monitoring of the port and perimeter. New safety regulations have been enforced in line with the requirements of the International Ship and Port Facility (ISPS) Code.

Implementation of the Kilindini Waterfront Operating System in 2008 has led to improved efficiency. The system has been interfaced with Kenya. Revenue Authority's Simba System and port users have begun to enjoy its benefits. The final phase of the port-ICT strategy will be the implementation of the Port Community-based System which will transform Mombasa into an e-port by 2010.

The Liquefied Petroleum Gas (LPG) import terminal design work is in the final stages, and the project is awaiting National Environmental Management Authority approval to commence. The facility, once completed, will accommodate tankers of up to 27,000 DWT and handle about 600,000 tons of LPG per year.

The new container terminal, funded jointly by the Japan Bank for International Cooperation and the Government of Kenya, is able to handle 1.2 million TEUs per annum, but container traffic fell from 615,733 TEUs in 2006 to 585,367 TEUs in 2007. Container yard residence is about 9,000 TEUs compared to a capacity of 14,500 TEUs.

A private company, Container Freight Stations (CFS), receives break-bulk cargo directly from ships, reducing cargo dwell time and congestion as well as enhancing yard planning. Recent purchases to boost

marine and cargo-handling operations are: a pilot boat, two ship-to-shore gantry cranes, eight rubber-tyred gantry cranes, five reach-stackers and one mobile harbour crane. A total of 23 global shipping lines use the port.

Malindi

Malindi town is a centre for the local fishing industry, but launching is done from the beach, boats are moored in the bay, and there are no facilities for conventional cargo handling. Sugarcane, coconuts and rubber have been grown in the area, but this activity has failed to promote the construction of a viable port.

Lamu (Manda Bay)

The port of Lamu is currently a small anchorage about 250 km from Mombasa within the deepwater Manda Bay sheltered by the Lamu Island. Development of Lamu requires minimal dredging and provides access to the open sea, allowing many ships to anchor as opposed to the situation at Mombasa, which is located in a creek that allows entry of one ship at a time.

The site has been selected to build a second deepwater port for Kenya and, if all negotiations and settlement of local opposition can be achieved, construction will begin in 2010. The reason for building a major port at Lamu is the draft of 18 metres compared to 13 metres at Mombasa. The port will accommodate planned bulk exports of petroleum products to be moved on rail or pipeline from Southern Sudan. A new and modern port will be built at Lamu (Manda Bay).The first stage will consist of two berths out of 22 berths that are to be built on a four-kilometre quayside in a project that will take five years. Most of the vessels calling at the Lamu port are expected to be large post-Panamax vessels.

The port project, estimated to cost Sh273 billion, will also serve as a trade corridor from Lamu to Juba in Southern Sudan after a standard-gauge railway is constructed. The Corridor would link the port with Garissa, Isiolo, Maralal, Lodwar and Lokichoggio. From Isiolo the Corridor would branch to Moyale on the border with Ethiopia. The viability of linking with Addis Ababa will be examined. From Lokichoggio the Corridor would also branch to the border with Southern Sudan. The Corridor is intended to serve the landlocked countries of Uganda, Rwanda and Burundi as well as the Eastern DR Congo. The viability of connecting the Corridor to Kigali (Burundi) will be examined.

Several investors such as Qatar, United Arab Emirates, the US, China and India have shown willingness to finance various project components that include an oil refinery and terminal and an international airport.

3. Policy and Governance of Ports and Shipping

All maritime and port activities are under the control of the Ministry of Transport. Kenya Maritime Authority (KMA), established by Act of parliament in 2008, is charged with control of ports and shipping in relation to the national responsibilities for international conventions, protocols, standards and liaisons. The KMA registers merchant shipping and provides for inspections and compliance with safety regulations.

Kenya Ports Authority (KPA) was established in 1978 by Act of Parliament and is located in Mombasa. It is a state-owned corporation with the responsibility to "maintain, operate, improve and regulate all scheduled seaports". It is an original investor in Kenya National Shipping Line, a state-owned corporation formed in 1989 when the government also brought together the operation and regulation of existing ferry services, including the Likoni Ferry service at Mombasa, into one subsidiary of the KPA named Kenya Ferry Services. The subsidiary was devolved to the status of an independent Kenya state-owned corporation in 1998.

4. Planning and Management of Ports

The ports are managed by KPA. The privatisation of the container terminal and some cargo handling services in Mombasa is a relatively new and positive development. The joint ownership of the petroleum products terminal by the government and oil companies has ensured efficient services and continual supplies of fuel. The private sector is being increasingly involved in the provision of services such as security, communications and dredging.

5. Developments and Trade

The Northern Corridor in the East African Community runs from Mombasa to several landlocked countries. Most of the traffic is with Uganda (75.9% of the transit market share, or 3.7 million tons, in 2008). Cargoes for DRC increased to 304,400 tons. Liquid-bulk cargoes were 5.63 million tons in 2008 but transhipment fell slightly, as did dry-bulk and break-bulk from Asian countries. There are five Export Processing Zones (EPZ) along the Corridor, namely, Mombasa, Athi, Nairobi, Della Rue and Nakuru, and more are being planned.

Kenya’s chief exports are horticultural products and tea. In 2005 the combined value of these commodities was US$1,150 million, about ten times the value of Kenya’s third most valuable export, coffee. Kenya’s other significant exports are petroleum products, sold to near neighbours, fish, salt, soda ash, sodium carbonate, sugar, cement, pyrethrum, and sisal. Africa is Kenya's largest export market, followed by the European Union. The major destinations for exports are the United Kingdom (UK), Tanzania, Uganda, and the Netherlands. Major suppliers are the UK, United Arab Emirates, Japan and India.

The leading imports are crude petroleum, beverages, chemicals, manufactured goods, machinery, pharmaceuticals, professional and scientific instruments, resins and transportation equipment. Kenya currently imports all its crude petroleum requirements. Petroleum accounts for 20-25% of the national import bill. Kenya Petroleum Refineries - a 50:50 joint venture between the government and several oil majors - operates the country’s sole oil refinery in Mombasa, which currently meets 60% of local demand for petroleum products. In 2004 oil consumption was estimated at 55,000 barrels a day. Most of the Mombasa refinery’s production is transported via the Mombasa-Nairobi pipeline.

6. Ports Impact and Benefits to Coastal Communities

The Coast Province has six Districts namely, Mombasa, Kilifi, Kwale, Tana River, Taita-Taveta and Lamu. These districts are administered by local government in terms of a number of national Acts covering agriculture, maritime, conservation, environment and fisheries.

The impacts of the ports on their immediate surrounds are minimal as these areas are primarily rural with subsistence agriculture the main activity. Efforts at improving maize yields and introducing better farm management practices are only partially successful due to low incomes and lack of capital, training and equipment. Fishing is a major source of income and food for communities living close to the shoreline, but there is little potential for expansion due lack of equipment, markets and distribution networks.

Tourism is a major industry all along the coast, and increases in the numbers of tourists, more affluent than the local population, provides the necessary markets for fish, fresh produce and agricultural crops that have the potential for expanding. In addition, the building of resorts provides employment and encourages production of cement, bricks, and a range of beverage and food products. The proposed development of the port of Lamu at Manda Bay would result in a significant increase in that potential for employment in the district and beyond.

7. SWOT Analysis

Strengths	**Weaknesses**
• Stable legal framework. • Agricultural potential and rainfall. • Strategic location relative to landlocked neighbours. • High proportion of entrepreneurial classes.	• Corruption and inefficiency in public sector (including the port and transport system). • Lack of development capital. • Local government obstruction of investments in modern agriculture.
Opportunities	**Threats**
• Development of Lamu Corridor (including deepsea port and terminal for mining exports from landlocked countries and opening up the interior and coast for development). • The currently planned modernisation measures in Mombasa will enhance efficiency and capacity, and promote further local industry. • Planned upgrades to cross-border procedures on the Northern Corridor will increase and improve transit trade to interior countries, along with creating further opportunities for the coastal communities.	• Failure of manufacturing economy to compete with imports from the East. • Lack of training institutions and skills deficiencies for sustainability of port and transport operations. • Competition from other corridor developments, e.g., Central Corridor in Tanzania. • Political instability of landlocked countries which would affect traffic volumes on Lamu and Northern Corridors.

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1. Introduction

Kenya, The Republic of Kenya, lies astride the equator in Eastern Africa between Somalia and Tanzania and bordering the Indian Ocean. With a total area of 582,650 square kilometres, Kenya has 536 kilometers of coastline on the Indian Ocean and the country is bounded by Ethiopia, Somalia, Sudan, Tanzania and Uganda. The official languages of Kenya are Swahili and English; many indigenous languages are also spoken.

The colonial history of Kenya dates from the establishment of a German protectorate over the Sultan of Zanzibar's coastal possessions in 1885, followed by the arrival of the Imperial British East Africa Company in 1888. Germany handed its coastal holdings to Britain and Kenya became a colony in 1890. Kenya became independent on December 12, 1963, and the next year became a republic and joined the Commonwealth.

Tourism and agriculture are the dominant industries of Kenya.

Kenya is a presidential representative democratic republic, whereby the President is both the head of state and head of government, and of a multi-party system. Executive power is exercised by the government. Legislative power is vested in both the government and the National Assembly. The Judiciary is independent of the executive and the legislature. The legal system of Kenya is based on the Kenyan statutory law, the Kenyan and English common law, the tribal law, and Islamic law.

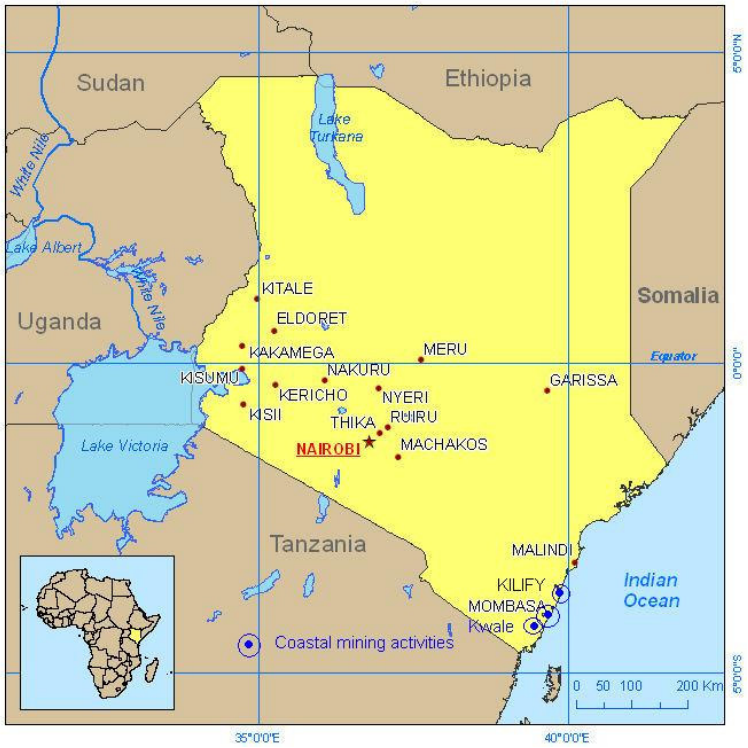

Figure 1: Map of the coastal Mining activities in Kenya

2. Mining Sector Overview

Kenya is not an important mineral producer. Mining and quarrying accounted for 0.5% of Kenya's 2008 GDP. Mineral exports accounted for between 2% and 3% of Kenya's total exports. Mining and quarrying was estimated to employ more than 50,000 Kenyans.

The major minerals produced in Kenya's mines are fluorspar and soda ash. Gold is produced in small quantities by artisanal mining although gold exploration by mining companies is increasing. Cement is the other mineral product of note in Kenya's economy. Kenya is a gemstone producer with deposits of ruby, pink sapphire and tsavorite (green garnet).

2.1 Coastal Mining Characteristics

The only large coastal mine in Kenya has been in the planning stage for ten years. The Kwale heavy sands mine was initially started by Tiomin Resources of Canada. The mine faced years of delays due to social and environmental obstacles. The Kwale project was sold in 2010 to Base Resources of Australia for $3 million. Base Resources is attempting to arrange financing and hopes to begin development of the mine in 2013.

Several cement factories are found along Kenya's coast using locally available limestone which they mine near the cement factories. Coral limestone and sand are mined on the coast and used in local construction.

Since the early 1950s, limestone has been used for cement manufacture in the Bamburi area near Mombasa. Cement production is now one of the major industries on the Kenyan coast.

Fossil coral limestone, the basic raw material for cement production, is excavated in shallow, heavily mechanized, opencast mines adjacent to the factories.

Coral limestone rock**s** that are excavated and shaped into coral blocks for building are available in large quantities in Manda Island of Lamu district. The production of limestone blocks currently meets local demand in Lamu District. Building blocks are in demand in Malindi and Mombasa.

Sand**,** an important building material, is mined in many areas along the Kenyan coast, including Tiwi in Kwale District.

Coastal mining Activity	Company Name	Production	Mining Method	Production Capacity (per year)	Stage of the Project / Status	Market
Cement plant	Athi River Mining Ltd	Fossil coral limestone, shale, gypsum	Open cast mine	Expected production of 360 000 tonnes per annum	Production	Local
Lime mining	Athi River Mining Ltd	Hydrated and quicklime	Open cast mine with kiln and hydrating units	Expected production of 25 000 tonnes per annum	Production	Local
Cement Plant	Bamburi Cement Ltd (Lafarge Group)	Coral limestone, Iron Ore, Shale, gypsum	Open cast mine	1.1 million tonnes per year	Production	Local and Export to Reunion, Uganda, Mayotte, Comoros, Seychelles
Informal coral limestone mining	Informal Artisanal mining activity	Building blocks	Quarry	-	-	Local
Informal sand mining	Informal Artisanal mining activity	Sand	Quarry	-	-	Local

2.2. Coastal Mining Activities Effects

Name of Mine	Location	Employment	Economic Benefits	
			National level	Micro-level
Cement plant (ARM Kenya)	Mombassa	700 direct employee	• Tax and revenue • Investment of the project	• Employment • Training for employees • Corporate and Social Responsibility undertaken by ARM Kenya
Lime mining (ARM Kenya)	Mombassa			
Cement Plant (Bamburi Cement Plant)	Mombassa	965 direct employee	• Tax and revenue • Investment of the project	• Employment • Training for employees • Corporate and Social Responsibility undertaken by Bamburi
Informal coral rocks mining	Roka, Bofa and Mtondia in Kilifi District	-	-	Income for local community

Informal sand mining	Tiwi, Msambweni in Kwale District, Mazeras and Junda on the Kisauni side of Tudor creek and Ngomeni, Arabuko Sokoke in Kilifi District.	-	-	Income for local community

3. Environment

Coastal Mining Activity	Environmental issues
Cement plant, Lime mining (Athi River Mining)	The cement industry generates emissions of dust, combustion gases, noise and particulate from the kiln stacks. The operation also generates wastewater, waste from plant maintenance and laboratory waste.
Cement Plant (Bamburi Cement Plant)	Gaseous wastes because the cement plants pumps out into the atmosphere combustion gases – i.e. NOx, CO, CO2, SOx, etc.
Informal limestone rock mining	Abandoned quarries
Informal sand mining	The over exploitation of sand in Kenya weakens the protection of the coast against erosion.

4. Human Environment

The coastal population in Kenya is culturally heterogeneous and diverse, due to its socio-economic dynamics, which offer great opportunities for livelihoods and leisure, the Kenyan coast has over the centuries attracted a multiplicity of ethnic and racial groups. Administratively, Mombasa District which is the most densely populated has a density of 280 persons per km2 while Lamu District is the least populated with a density of less than 10 persons per km2.

4.1 Socioeconomic Indicators

Social indicator	Kenya
Social indicators	
Total population	35,884,000
Population growth rate	2.6%
Economical indicators	
GDP (2009)	US $32.724 billion
GDP per capita	$912
GDP (growth rate)	2%

4.2 Corporate and Social Responsibility of the Coastal Mining Project Company

Coastal Mining Activity	Corporate and social responsibility (CSR) – or Social benefits from the coastal mining activity
Kwale Mineral Sands Project	Project in planning stage
Cement plant, Lime mining, Sodium Silicate mining (Athi River Mining)	**Social Care**: ARM was involved in various social projects include the following. • Donated food and clothing to the less fortunate people of Mavoko Municipal Council. • Donated cement to various churches in Mulologo, Athi River and Kaloleni. • Construction of roads that lead to quarry sites in Kenya. • In 2007, ARM helped in establishing dormitories in Kajiado Central District, at the Kenya Marble Quarries primary School (KMQ). This has been in aid of the Masai girl children especially those pressured to marry of at a young age. The shelter cum institution aids in their education and empowering them. **Environmental care**: • Winning the 2006 certificate of environmental conservation (NEMA). • ARM has expanded its tree nursery in Athi River as well as gained a letter of compliance. • It has partnered with other public institutions and planted seedlings in Athi River, Kaloleni and Kitengela. • 42,000 seedlings have been donated to various public institutions for planting. • ARM has joint efforts with Mavoko Municipal Council and has set up the town's beatification program.
Cement Plant (Bamburi Cement Plant)	**Kenya Youth Soccer Events (KYSE*)*** organizes football tournament for boys under 14yrs in Mombasa. In 2008, they got a donation of Ksh 400,000 from Bamburi Cement. In 2009, they were given Ksh 500,000 for their preparations of 2010 tournaments. **School refurbishment project: B**amburi Cement handed over three school refurbishment projects it had completed as part of its community education support programme. The company said it had invested over KSh16 million on the facilities in Mombasa, Diani and Likoni. Managing director Hussein Mansi said the company has been investing in schools in the communities where Bamburi Cement has operations; as well as neighbouring communities. One of the schools that received the bulk of this support is Bamburi Primary School in the Bamburi area of Mombasa. The school was constructed by Bamburi Cement in 1967 on a four-acre plot provided by the company and was handed over to the municipal council of Mombasa in 1972. It has 900 pupils (500 boys and 400 girls) drawn mainly from disadvantaged informal settlements (slums) of Mombasa.

Informal coral rock mining	The coral rock mining provides revenue for the local community in the coastal zone. It also gives a low cost building material for the population.
Informal sand mining	The sand mining provides revenue for the local community in the coastal zone.

5. Policy and Governance

5.1 Policy and Legislation

Coastal Mining Regulations	Description - Comments
Mining activities laws and regulations	Act No 306 related to the "Act of Parliament to consolidate the law relating to mining".
Environmental regulations	• Environmental Management and Coordination Act No 8 of 1999 • The water Quality Regulations, 2006 (Legal notice No. 121). • The Waste Management Regulations, 2006 (Legal Notice No.121) • The Controlled Substances Regulations, 2007 (Legal Notice No.73 of 2007)
Land tenure management	• Lands excluded from prospecting and mining are set out in the Law No 22 of 1954, the Law No 142/1963, the Law No.56/1965, the Law No 21 of 1966, and the Law No 12 of 1970. • Act No 295 related to land acquisition • Land Planning Act, No 303

5.2 Governance

Entity	Responsibility/ Description
Ministry of Environment Natural Resources and Wildlife	The Ministry of Environment & Natural Resources is charged with the responsibility of Environmental Policy, Environmental Impact, Assessments and Coordination Development of Forests, Reforestation and Agro forestry, Catchments Area Conservation, Mineral Exploitation and Mining, Geological Surveys, Permanent Presidential Commission on Soil Conservation and reforestation, Kenya Forestry Research Institute, Resource Surveys and Remote Sensing.
Department of Mines and Geology	The Department of Mines and Geology is responsible for: • Carrying out geological Survey and Research • Maintenance of Geo-scientific database and information • Administration of legislation relating to mineral resources development • Mining and Mining Policy formulation • Advising the Government on Mineral Policy matters • Supervision of quarry and Mine safety • Security of commercial explosives.
National Environment Management Authority (NEMA)	The National Environment Management Authority (NEMA) is established under the Environmental Management and Coordination Act (EMCA) No. 8 of 1999, as the principal instrument of government in the implementation of all policies relating to the environment.
Kenya Chamber of Mines	The Kenya Chamber of Mines was registered as an association on 17th July 2000. It was formed under the Companies Act (Cap 486) as a private company. The objective of the Kenya Chamber of Mines is to work hand in hand with the government to ensure that sensible, pragmatic laws govern the mineral industry and maintain high standards and correct core values in the industry.
Coast Development Authority (CDA)	The Coast Development Authority (CDA) is Kenya's Regional Development Authority. It is created by the CAP 449 related to the "Coast Development Authority". Its area of jurisdiction is within the coastal belt, covering all the 13 districts of the Coast Province. The authority's operational area has a total population of about 3 million people.

5.3 Planning and Management

Investment facilitator

Kenya Investment Authority (KenInvest) is a statutory body established in 2004 through an Act of Parliament (Investment Promotion Act of 2004) with the main objective of promoting investments in Kenya. It is responsible for facilitating the implementation of new investment projects, providing after care services for existing investments, as well as organizing investment promotion activities both locally and internationally. The core functions of KenInvest include; Policy Advocacy; Investment Promotion; Investment Facilitation; Investor Tracking and After Care Services.

Environment Management

The National Environment Action Plan and the National Policy on Environment emphasize the need for environmental impact assessment (EIA) on development projects. The environmental Management and Coordination Act (1999) clearly makes EIA mandatory for all projects specified in the Act. NEMA is ultimately responsible for issuing, varying or cancelling environmental impact assessment licenses, will coordinate the EIA process. NEMA is also responsible for coordinating powers over all public and private sectors.

Integrated Coastal Zone Management (ICZM)

The development of the National ICZM Policy of Kenya has been finished and validated by stakeholders. It awaits endorsement by Parliament.

The ReCoMap Program helps Kenya to develop the necessary tools, including land use planning and other skills, for the preparation and implementation of its own national integrated coastal zone management plan.

5.4 Development, Trade and Projects

Policy Planning Initiative	Objective
Poverty Reduction Strategy Paper Kenya (2005)	This investment programme presents a set of priorities of government actions designed to meet the medium-term objectives of the Economic Recovery Strategy. The ERS presents a multifaceted strategy to meet economic growth, equity and poverty reduction, and governance objectives.
Kenya Vision 2030	The Kenya vision 2030 is the country's new development blueprint covering the period 2008 to 2030. It aims to a newly industrializing, "middle-income country providing a high quality life to all its citizens by the year 2030"
Long-term Strategic Development Plan (Kilifi District) , 2001 - 2015	The long term strategic development plan describes the development problems and issues of the district and delineating potentials, principles and goals of district development. The document reflects the political will of the district population, its opinion leaders and its decision makers concerning the future development of the district.
Natural Resource Management Programme (NRMP)	The program will support strategies and annual work plans of the participating institutions; hence, the monitoring system will be fully integrated into the monitoring systems and procedures of the institutions. However, support will be available to upgrade and capacitate this important function in Ministry of Environment & Mineral Resources (MEMR), NEMA and OPM.

Development project	NGO / Donor / Private Sector	Project details
Regional Coastal Management (ReCoMap)	European Union	ReCoMap is a regional programme for the sustainable management of the coastal zones of the countries of the Indian Ocean. It is an initiative of the Indian Ocean Commission which deals with seven countries of the region, namely Mauritius, the Seychelles, Madagascar, the Comoros Islands, Kenya, Tanzania and Somalia. The programme started in August 2006 and will end in 2011. The Programme aims at the improved valorisation and sustainable management of coastal resources of the seven countries of the region.
Kenya Coastal Development Project	World Bank	The development objective of the Coastal Development Project is to promote an environmentally sustainable management of Kenya's coastal and marine resources by strengthening the capacity of existing relevant government agencies and by enhancing the capacity of rural micro, small and medium-sized enterprises in selected coastal communities.
Arabuko-Sokoke Forest Management and Conservation Project	Kenya Wildlife Service, Kenya Forestry Research Institute and National Museum of Kenya	The aim of the project is to enhance conservation of Arabuko-Sokoke's biodiversity and ecological functions, as well as the socio-economic and cultural values. The broad components of the project are: natural forest management and conservation; rural development; visitor and conservation education and training, monitoring and evaluation.
Coastal Areas Management	UNDP	To support coastal development and management in Kenya

6. SWOT Analysis

Strengths	**Weaknesses**
• Strong environmental regulation • Government supports mining development • Strong development strategy papers	• Much of Kenya has not yet been prospected • No national legislation for coral and sand mining. • Quarrying and sand harvesting activities are regulated by local authorities.
Opportunities	**Threats**
• Proposed development of Kwale Heavy Sands Project • ICZM to be made operational soon	• Over exploitation of coral and sand in the coastal zone would affect the environment.

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