EXECUTIVE SUMMARY

In line with Kenya’s Vision 2030 and the current Global phenomenon the Seaquarium Ltd in collaboration with the local community seeks to utilize the Marine Natural Resources at the coast and bring economic improvement to the community of Waa area of Kwale County and the Country at large by opening the Worlds largest open water whale shark enclosure. The project aims to establish whale shark tourism in the country while making a push for the conservation of the giant fish. Whale sharks are the world’s largest fish and are completely docile.

The Seaquarium Ltd, which has been working on the unique conservation project for the past four years, plans to place two juvenile whale sharks in a sanctuary, where visitors will have an opportunity to swim with whale sharks.

The broad objectives of the project will be:

- To introduce community and investor collaboration in sustainable utilization of marine natural resources and help to conserve biodiversity
- To introduce whale shark tourism in Kenya and put Kenya to compete in the USD 380,000,000 Whale Shark Tourism in the world and bring foreign exchange;
- To give the local fisheries Beach Management Units (BMU) the fiscal and technical capacity to sustainably manage the marine natural resources and realise economic benefits for their community.

The introduction of whale shark Tourism activity in the place will lead to diversification of area’s economy and create funds to transfer from poor fishing practice to better practice and from the tourism sector to other sectors. Fishermen using destructive fishing gears like beach seining nets and canoes along the reef lack funds to buy better fishing equipment. Concentration of artisan fishing along the reef has led to destruction of corals. Funds created through the whale shark Tourism activity by the local fisheries BMU will enable the local fishermen to purchase strong and better fishing equipment and move away from the reef to venture into off shore fishing to improve their fish catch production. This would give them better income as well as allow the coral reef ecosystem to regenerate hence bring biodiversity conservation and livelihood improvement.

The Waa Community in Kwale is essentially a fishing community and they draw their livelihood from near shores fishing. In the last few years there has been an influx of foreigners in the area due to the humid climatic conditions and good tourist attractions along the coast.

The positive impacts to the project are discussed below:

**Environmental conservation**

The project has been designed with a view of injecting fiscal and technical capacity in sustainable utilization of marine natural resources through the local community and private investor collaboration to achieve the desired goal of biodiversity conservation and economic empowerment to the surrounding area and the country at large.

**Economic development**

The project will improve on economic development and have impact on poverty reduction through enhanced and diversified sectors of economy. Currently the community is dependent on Fisheries sub sector of the economy that is not well developed and sustainable hence the introduction of Tourism activities will bring diversification and create improved income and therefore reduce poverty (Appendix 1 Revenue Estimates for the Project).
Foreign Exchange

The project will have impact by increasing the number of tourists and thereby result in an increase in flow of foreign exchange to the country. The introduction of whale shark into an open water enclosure will mark the beginning of whale shark Tourism in Kenya and in Africa. The whale shark is the biggest fish in the ocean and these gentle giants are known to be harmless to humans. Worldwide it is considered to be a number one wildlife encounter if one is lucky enough to swim with a whale shark. The world whale shark Tourism is also known to have a tremendous growth over the last decade with Australia having the biggest market share worth US Dollar 30,000,000 in 2010 followed by Mexico with the beginning turn over of US Dollars 240,000 in 2002 (4 month season) with a staggering growth to 17,800,000 in 2011.

Variety of the Big 'Five'

Kenya would have a chance to brand itself as a country of the Big Six instead of the Big Five and easily compete in the International Tourism Market.

Research and Innovation

The ultimate impact that these animals have on the public is of great value. Currently a handful of Kenyans have had the opportunity to observe a living whale shark. Seeing a whale shark is not only possible for those who can afford to travel to far-off locations, or the lucky few fishermen and boaters who happened upon one out at sea. Upon opening of the Seaquarium, Kenyans will now have the opportunity to observe these magnificent animals and listen to an informative presentation about their biology. Standing only inches away from a 20 feet living animal has significantly more impact than watching a two-dimensional animal on television or viewing a photo in a magazine.

The Seaquarium will offer research opportunities to local universities and research institutions. Indeed MoU documents are currently being drawn up to formally link The University of Nairobi, The Kenya Marine and Fisheries Research Institute, The Department of Fisheries and the Project Proponent. The MoU seeks to avail the Seaquarium to researchers from these institutions to undertake joint research projects. This opportunity will offer immense exposure and value to these institutions. As noted elsewhere, revenues generated by the Seaquarium will be used to help promote research and conservation of whale sharks in the wild, particularly off the Indian coast of Kenya.

Preliminary negative impacts of whale shark enclosure are discussed below:

Deaths of the whale sharks

The possible threat to the whale shark enclosure is the deaths, as reported in Georgia Aquarium in Atlanta if the Whale Sharks are not properly taken care of.

Mitigation measures:

- The project proponent will have in its team qualified Marine Biologists and Veterinary Doctors to take care of the welfare of the whale sharks in the enclosure;
- The whale sharks will be kept in their normal habitat in the open sea, not in a superficial environment.

Safety of the tourists

There is a possible threat to the safety of the tourists while swimming with the Whale Sharks, if safety procedures are not properly taken care of.

Mitigation measures:
The safety of the Whale Shark and Tourists will be a priority. All PPE used by the participants will be owned and managed by the seaoarium. The project proponent will routinely sanitize all PPE hence mitigate concerns that something undesirable or unsanitary would be exposed to the whale sharks and other marine flora and fauna.

During the pre-dive orientation, safety rules will be carefully explained to the visitors and swimmers. Guests will be instructed on the proper procedures and the importance of observation-only during their swimming and diving tour. The dive program will be a guided tour and not a free swim. Any behaviour outside of the instructions (such as trying to touch the animal or get to close to it) will result in the removal of the guest from the seaoarium. After the initial orientation, guests will receive an additional on-deck briefing, reiterating the safety rules during the guided tour.

Guests will be instructed to stay together in buddy pairs and to follow the lead Dive Master. A Safety Diver will bring up the rear and will be monitoring and assisting the guests, while another Safety Diver will maintain the group from the side. Both the two Safety Dive Masters and Lead Dive Master will carry a visual and physical barrier i.e hard nets for the animals if necessary. A fourth Dive Master on deck will monitor the dive and will be prepared to enter the water and activate emergency response if necessary.

The above safety rules are set in order to avoid inflicting any and all unnecessary stress to the whale shark. The whale shark is completely harmless to humans.

Migration disturbance

Whale Sharks are known to be highly migratory, with studies demonstrating migrations of at least 13,000 km over 37 months (Eckert and Stewart, 2001). Current information on migration patterns is scarce, though Norman (2004) is currently investigating movements of Whale Sharks from Ningaloo Reef to Christmas Island to coincide with the mass spawning of the red land crab (G. natalis). Currently there is no information available regarding threats to the migration patterns followed by Whale Sharks.

Mitigation measures:

• The project provides a very good avenue for research in migration patterns of the whale sharks as the captured whales will be tagged and released after every 6months. Upon release they will be mapped using GPS as they migrate;
• Earlier satellite tagging expeditions undertaken in Kenya 2007-2008 showed that about 70% of the whale shark population stayed in East Africa all year round. (Stewart 2011).

Sound disturbance

Unlike cetaceans, sharks do not use sound to communicate with each other. However, sharks do sense sound as pressure through their lateral line system, and it is possible that high decibel sounds may negatively impact on Whale Sharks. Experiments have demonstrated that sharks can hear sounds with frequencies ranging from about 10 Hertz to about 800 Hertz (Martin, 2004). The effects of very loud sounds on shark behaviour are not well documented; however it is possible that they could potentially disrupt normal behaviours such as feeding, mating, or migrating from one place to another.

Mitigation measures:

• Standard Operating Procedures will be put in place to control noise within the enclosure.
INTRODUCTION

1.1 Background of the project

Kenya Vision 2030 is the new long-term development blueprint for the country. The aim of the 'Vision' is to create a 'globally competitive and prosperous country with a high quality of life by 2030'. In Kenya, the environment and tourism have always been inextricably linked, in a truly symbiotic relationship. Wildlife in particular has always served as one of our major tourist draw cards, and the resultant revenue has played a major role in the country's development. In recognition of this, the Government of Kenya has placed great priority on wildlife preservation in Kenya.

Eco-tourism, and community wildlife and conservation ventures offer the visitor a personalized and rewarding wildlife experience that gives them a chance to appreciate, respect and protect our country's wildlife.

Genuine eco-tourism means that tourism will have no negative impact on ecosystems, and that it positively contributes to the destination on a social and environmental level. Visitors should learn from their experiences and develop a greater understanding of the issues and challenges of preserving this great natural heritage for generations to come.

Kenya's dedication to eco-values sets it apart from many other African destinations. This has again been proved by the "Eco-Ratings" scheme- a project by the Eco-Tourism society of Kenya (ESOK) www.ecotourismkenya.org.

Community based tourism and eco tourism is a growing sector, globally. It currently accounts for 5% of the global tourism market and is growing at a rate of 20-30% annually. Increasing numbers of tourists nowadays want to interact with local communities and they want to stay in places that positively impact on both the environment and the local population.

Throughout Kenya there is growing awareness of the benefits of community based tourism projects. Communities that have allowed access to their land have seen their lifestyles improved through increased revenue through wages, land leases and development funds. Many projects have built boreholes, schools and clinics for the local community.

There are a growing number of community tourism projects in Kenya, ranging from II Ngwesi and Tassia in the Laikipia area, Sarara in Namunyak, Shompole in the Magadi region and Losikitok in Amboseli.

The projects range in scale from complete community management to a partnership with an investor or trust who provides the capital to build the guest accommodation and related tourist facilities. The community provides the use of the land, through a lease and helps to ensure the protection of the local wildlife. Community members are often employed and trained in the tourism projects and benefit from wages, community development funds and involvement in spin-off enterprises.

In Kenya, the community based tourism concept is just taking root and there is a need to harness this product and direct it towards the market in a more cohesive and systematic manner. Indeed there is a dire and urgent need for comprehensive and holistic pro-community regulations to be put in place.

In line with Kenya's Vision 2030 and the current Global phenomenon the East African Whale Shark Trust in collaboration with the local community seeks to utilize the Marine Natural Resources at the coast and bring economic improvement to the
community of Waa area of Kwale County and the Country at large by opening the Worlds largest open water Whale Shark enclosure. The project aims to establish whale shark tourism in the country while making a push for the conservation of the giant fish. Whale sharks are the World's largest fish and are completely docile.

The EAWST, which has been working on this unique conservation project for the past four years, plans to place two juvenile whale sharks in a sanctuary, where visitors will have an opportunity to swim with whale sharks.

The broad objectives of the project will be:

- To introduce community and investor collaboration in sustainable utilization of Marine Natural Resources and help to conserve biodiversity
- To introduce whale shark Tourism in Kenya and put Kenya to compete in the USD 380,000,000 Whale Shark Tourism in the world and bring foreign exchange;
- To give the local Fisheries Beach Management Units the fiscal and technical capacity to sustainably manage the marine natural resources and realise economic benefits for their community

1.2 The whale shark species

The whale shark, (*Rhincodon typus*), is a slow-moving filter feeding shark and the largest fish species in the world. The largest confirmed individual whale shark had a length of 12.65 metres (41.50 ft) and a weight of more than 21.5 tonnes (47,000 lb), and there are unconfirmed reports of considerably larger whale sharks. Claims of individuals over 14 metres (46 ft) long and weighing at least 30 tonnes (66,000 lb) are not uncommon. The whale shark holds many records for sheer size in the animal kingdom, most notably being by far the largest living non-mammalian vertebrate, rivalling many of the largest dinosaurs in weight. It is the sole member of the genus Rhincodon and the family, Rhincodontidae (called Rhiniodon and Rhinodontidae before 1984), which belongs to the subclass Elasmobranchii in the class Chondrichthyes. The species originated approximately 60 million years ago.

The whale shark is found in tropical and warm oceans and lives in the open sea with a lifespan of about 70 years. Although whale sharks have very large mouths, as filter feeders they feed mainly, though not exclusively, on plankton, which are microscopic plants and animals. However, the BBC program Planet Earth filmed a whale shark feeding on a school of small fish. The same documentary showed footage of a whale shark timing its arrival to coincide with the mass spawning of fish shoals and feeding on the resultant clouds of eggs and sperm.

1.2.1 Distribution and habitat

The whale shark inhabits all tropical and warm-temperate seas. They are known to migrate every spring to the continental shelf of the central west coast of Australia. The coral spawning of the area's Ningaloo Reef provides the whale shark with an abundant supply of plankton. Primarily pelagic, seasonal feeding aggregations occur at several coastal sites such as the southern and eastern parts of South Africa; Kenyan Coast, Gladden Spit in Belize; Ningaloo Reef in Western Australia; Great Rann of Kutch in India; Utila in Honduras; Donsol, Pasacao and Batangas in the Philippines; off Isla Mujeres and Isla Holbox in Yucatan, Mexico; Ujung Kulon National Park in Indonesia; Nosy Be in Madagascar Off Tofo Reef near Inhambane in Mozambique, and the Tanzanian islands of Mafia, Pemba, Zanzibar and, very rarely, Eilat, Israel.
Although typically seen offshore, it has been found closer to land, entering lagoons or coral atolls, and near the mouths of estuaries and rivers. Its range is generally restricted to about ±30° latitude. It is capable of diving to depths of at least 1,286 metres (4,219 ft), and is migratory. On 7 February 2012, a large whale shark was found floating 150 kilometres (93 mi) off the coast of Karachi, Pakistan. The length of the specimen was said to be between 11 and 12 metres (36 and 39 ft), with a weight of around 7,000 kilograms (15,000 lb).

In 2011 the largest aggregation of whale sharks ever recorded was reported from the Yucatan coast of Mexico, in which more than 400 animals gathered in one place to feed on spawn from the little tunny, *Euthynnus alletteratus*.

### 1.2.2 Description

As a filter feeder it has a capacious mouth which can be up to 1.5 metres (4.9 ft) wide and contains 10 filter pads and between 300 and 350 rows of tiny teeth. It has five large pairs of gills. Two small eyes are located towards the front of the shark's wide, flat head. The body is mostly grey with a white belly; three prominent ridges run along each side of the animal and the skin is marked with a checkerboard of pale yellow spots and stripes. These spots are unique to each individual and are useful for counting populations. Its skin can be up to 10 centimetres (3.9 in) thick. The shark has a pair each of dorsal fins and pectoral fins. Juveniles' tails have a larger upper than lower fin while the adult tail becomes semi-lunate (crescent-shaped). Spiracles are just behind the eyes.

### 1.2.3 Diet

The whale shark is a filter feeder – one of only three known filter feeding shark species (along with the basking shark and the megamouth shark). It feeds on macroalgae, plankton, krill, Christmas Island red crab larvae and small nektonic life such as small squid or vertebrates. It also feeds on small fish and the clouds of eggs and sperm during mass spawning of fish shoals. The many rows of vestigial teeth play no role in feeding. Feeding occurs either by ram filtration, in which the animal opens its mouth and swims forward, pushing water and food into the mouth, or by active suction feeding, in which the animal opens and closes its mouth, sucking in volumes of water that are then expelled through the gills. In both cases, the filter pads serve to separate food from water. These unique, black sieve-like structures are presumed to be modified gill rakers. Food separation in whale sharks is by cross-flow filtration, in which the water travels nearly parallel to the filter pad surface, not perpendicularly through it, before passing to the outside, while denser food particles continue to the back of the throat. This is an extremely efficient filtration method that minimises fouling of the filter pad surface.

Whale sharks have been observed "coughing" and it is presumed that this is a method of clearing a build-up of particles from the filter pads. Whale sharks migrate to feed and possibly to breed.

The whale shark is an active feeder, targeting concentrations of plankton or fish. It is able to ram filter feed or can gulp in a stationary position. This is in contrast to the passive feeding basking shark, which does not pump water. Instead, it swims to force water across its gills.

### 1.2.4 Behaviour towards divers

Despite its size, the whale shark does not pose significant danger to humans. Although massive, whale sharks are docile fish and sometimes allow swimmers to catch a ride, although shark scientists and conservationists discourage this practice. Younger whale sharks are actually quite gentle and can play with divers.
1.2.5 Conservation status

The whale shark is targeted by commercial fisheries in several areas where they seasonally aggregate. The population is unknown and the species is considered vulnerable by the IUCN. It is listed, along with 6 other species of shark, under the CMS Memorandum of Understanding (MoU) on the Conservation of Migratory Sharks.

1.3 Project Location

The project will be established in Waa Location of Kwale County in Kenya’s south coast. The project will be implemented along the reef and up to a minimum water depth of 14 meters depending on water tide.

The project is situated at approximately 15km South Coast of Mombasa town along the Mombasa to Lunga Lunga Road and is approximately 15 minutes drive to the Diani Beach. The area is endowed with a high attraction of coastal and marine natural resources that include the fringing coral reef as well as a high diversity of marine life species. Some of the endangered species are also found here like the sea turtles, whale sharks, Dolphins and the coconut crabs (See Figure 1.1). The enclosure will be located next to Waa village, Kwale County. Waa is located right between Mombasa and Diani beach, about 18 km from Likoni.