



**COMMUNITY BASED  
ENDANGERED MARINE SPECIES  
CONSERVATION  
IN TANZANIA**

**SEA SENSE ANNUAL REPORT 2011**

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### **Executive Summary**

Between January and December 2011, 379 sea turtle nests were recorded by Sea Sense and 33,453 sea turtle hatchlings safely reached the sea. Peak nesting was in April and the hatching success rate was 74% for green turtles and 80% for hawksbill turtles. 166 dead turtles were recorded (either slaughtered or caught in nets) along the coast. Two cases of fibropapilloma were documented in Tanzanian waters. Sea turtle ecotourism activities generated revenue in Mafia, Temeke and Pangani Districts. Four Turtle Tour Guides guided visitors to nesting beaches. 11 live dugongs were sighted by local fishers in Rufiji and Mafia Districts and reported to Sea Sense. Seven dead cetaceans were recorded by Conservation Officers. Four dugong awareness workshops were held in Rufiji District targeting CFMA committee members. World Environment Day and World Sea Turtle Day events were held in Mafia District. Training, education and awareness were provided to teachers, fishers, village leaders, school pupils and hotel staff. 13 magazine articles were published and two presentations made at the 31<sup>st</sup> International Sea Turtle Symposium. A new website was launched together with a Facebook page. Two UDSM students completed an eight week placement with Sea Sense. Sea turtle slaughter, live coral mining, mangrove harvesting and dynamite fishing continue to be practiced despite efforts to curb them.

## **1. Introduction**

The Tanzania coastal region supports a diverse array of marine habitats, many of which are critical for the survival of coastal communities. There is significant pressure on marine and coastal resources related to high human settlement in the coastal zone coupled with high levels of poverty. High dependency on coastal resources has led to resource utilization at unsustainable levels and threatens the marine biodiversity of Tanzania and the livelihoods of coastal communities.

In recognition of this, Sea Sense, a community-based Tanzanian NGO, was set up in 2001 and currently operates in six coastal districts in Tanzania. Sea Sense targets the conservation and promotion of flagship species (e.g. sea turtles, dugongs, whales, dolphins), whose continued survival is implicitly linked with the protection of the wider coastal and marine ecosystem. Sea Sense works closely with coastal communities to deliver tangible conservation benefits, improve understanding and knowledge of natural resource management and develop sustainable livelihoods that bring positive economic outcomes for impoverished rural communities who depend solely on natural resources for their survival.

Activities started in Mafia District and in 2004, the scope of the NGO was scaled up to cover key districts on the mainland coast of Tanzania.

This report highlights activities and progress by Sea Sense during 2011.

## **2. Objectives**

The overall objective is to enhance the conservation status of sea turtles, dugongs, whale sharks and other species of conservation interest, as well as their habitats in Tanzania by assessing population abundance, distribution and threats, raising awareness and helping communities to find alternatives to unsustainable activities.

The specific objectives are to:

- conserve dugongs by implementing the Conservation and Management Plan of the UNEP/CMS Memorandum of Understanding on Dugongs; incorporate conservation measures into Collaborative Fisheries Management Area action plans and disseminate results to communities through awareness-raising activities;
- protect endangered sea turtles through a programme of community-based nest protection and monitoring; conducting community awareness-raising; and promoting sea turtle ecotourism;
- contribute to protection of whale sharks and cetaceans through community awareness-raising;
- increase public awareness and education about the status and threats to marine resources in Tanzania;
- enhance multilevel national capacity for monitoring, research and management; and
- disseminate results to national and regional partners and the wider scientific community.

### 3. Implementation & Results

#### 3.1 Dugong Conservation

##### 3.1.1 Live Dugong Sightings

In 2004, Sea Sense established a community dugong monitoring network in the Rufiji Delta to provide data on the distribution and abundance on dugongs. The network has confirmed the presence of a small, breeding population in the Rufiji Delta and has raised awareness of the plight of the dugong in Tanzanian waters. The majority of dugong sightings are reported to Sea Sense Conservation Officers by members of the local fishing community.

There have been 11 live dugong sightings in 2011. Ten of the observations were reported in Rufiji District, in the southern Delta. Sightings were concentrated between Pombwe and Mbwera. Sightings were reported in May, June, July, October, November and December.

A lone dugong has been sighted several times near to Tumbuju on the west coast of Mafia Island since 2009 and was observed again in July 2011.

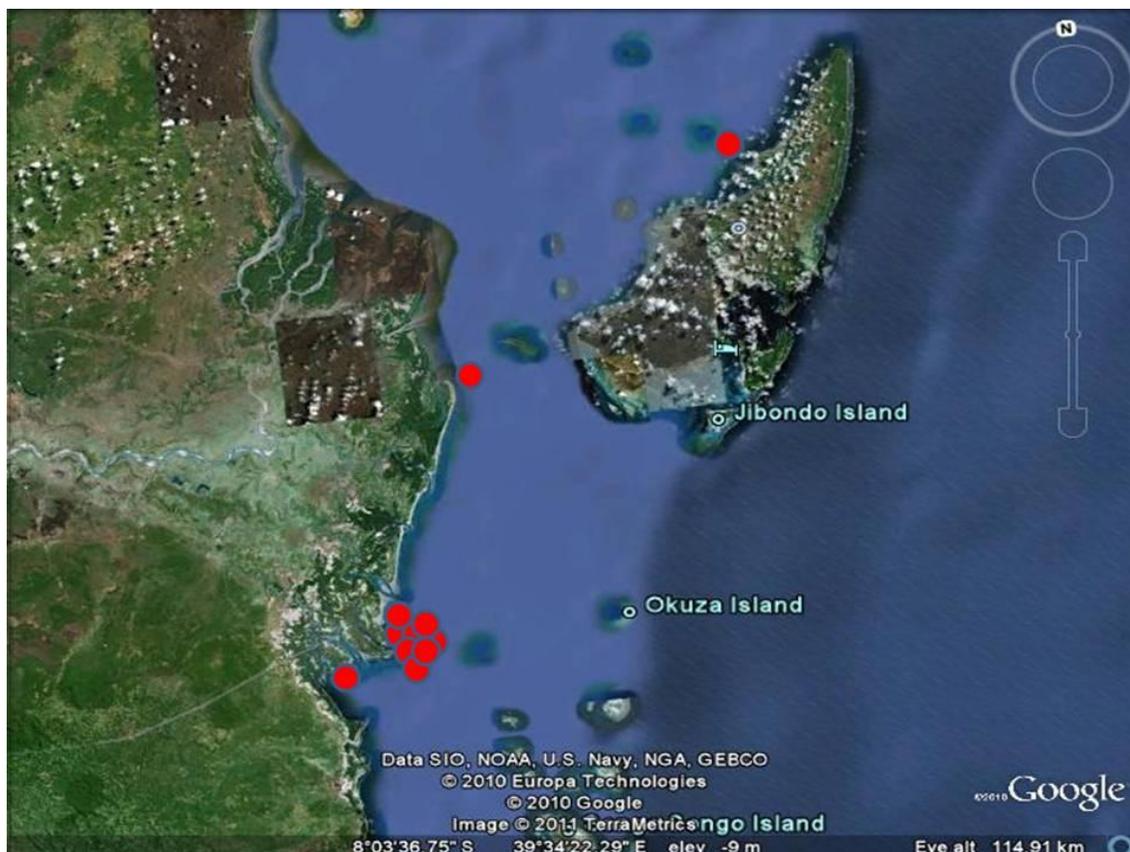
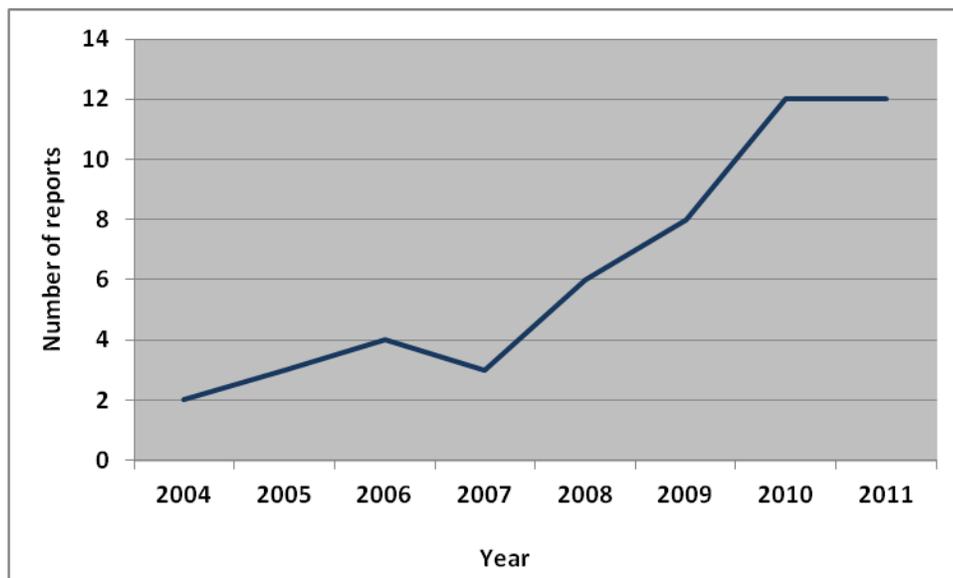


Figure 1: Live dugong sightings, 2011

### 3.1.2 Dugong Mortalities

There were no reported dugong mortalities in 2011.

Since the establishment of a dugong monitoring network in the Rufiji Delta in 2004, 51 dugong sightings have been reported to Sea Sense. Of these, 37 were live sightings (including two mother/calf pairs), 13 had drowned from capture in gillnets (including one mother/calf pair) and one was stranded on a beach. Even though sightings are still rare, there is clear evidence that a small, breeding population exists in the Rufiji Delta. There has been a steady increase in the number of reports of dugong sightings since 2004 (Figure 2) which can most likely be attributed to recent Sea Sense dugong awareness workshops.



**Figure 2: Number of reported dugong sightings in the Rufiji Delta, 2004 - 2011**

Sea Sense is using data collected by the monitoring network to develop mitigation measures aimed at reducing gill net mortality eg, promotion of temporal and spatial closures in key dugong habitat and to ensure community training and education programmes are targeted effectively. It is critical that conservation efforts are directed at reducing mortality from gill nets as the current rate of gill net capture is not sustainable for a population that is thought to be less than 100 individuals.

### 3.1.3 Dugong Survey

In June, Sea Sense visited Tumbuju on the west coast of Mafia where a live dugong has been observed and reported regularly since the end of 2009. Sea Sense met informally with fishers at the fish landing site in Tumbuju to discuss the dugong sighting and assess the level of awareness of dugong biology and conservation. Most of the fishers were unwilling to admit they had seen the dugong and claimed to know nothing about the presence of a dugong in their local area. This was most likely due to the fear of the establishment of a protected area and the loss of traditional fishing rights.

Following discussions with the fishers, Sea Sense met with the Chunguruma Beach Management Unit (BMU) secretary who agreed to discuss the issue further with the fishers and provide feedback to Sea Sense.

Sea Sense then conducted a boat survey on Tumbuju reef, near to Mbarakuni Island where the dugong had been sighted. The survey lasted for four hours but the dugong was not observed. This may have been due to the presence of six fishing boats on the reef causing the dugong to seek refuge elsewhere.

Sea Sense maintained regular contact with BMU leaders in the area to ensure sightings were reported and to raise awareness of the need to protect dugongs. Sea Sense staff visited Tumbuju fish landing site again in October to gather updated information on sightings of the dugong and encourage cooperation from the fishing community. The BMU secretary from Chunguruma met with Sea Sense and reported that there had been no further sightings since July but was confident that local fishers were ready to cooperate and provide information.

#### **3.1.4 Dugong Workshops for CFMA Members**

The increased degradation of coastal and marine ecosystems and decreases in yield of important fish stocks in Tanzania has led to the development of Collaborative Fisheries Management Areas (CFMA's) as a vehicle for achieving sustainable marine resource use and engaging coastal communities in their conservation. In March and June, Sea Sense held dugong awareness workshops targeting the statistics and monitoring/surveillance committees of two CFMA's (NJISOPOJA and MBEWKIEKI) in Rufiji and Kilwa Districts. The objectives of the workshops were:

- To determine the level of understanding of roles and responsibilities within a CFMA
- To share historical knowledge of dugongs in Tanzania.
- To improve understanding of the current status of dugongs in Tanzania and across their global range
- To raise awareness of natural and anthropogenic threats faced by dugongs and other endangered marine species.
- To facilitate incorporation of dugong protection measures into CFMA action plans
- To raise awareness of the Tanzania Fisheries Regulations 2009 that incorporate new legislation protecting dugongs
- To raise awareness of the establishment of the national Tanzania Turtle and Dugong Conservation Committee

Each workshop followed the same format. Participants were invited to form small groups to discuss a number of topics relating to their roles within the CFMA, threats to dugongs and the relevance of dugong conservation. Following the group discussions, one member from each group presented their findings to the rest of the workshop participants while other participants were invited to comment on

the presented topic. Sea Sense also added further information during the discussions and clarified misinformation relating to several of the topics.



***Plate 1: Dugong awareness workshop, NJISOPOJA CFMA***

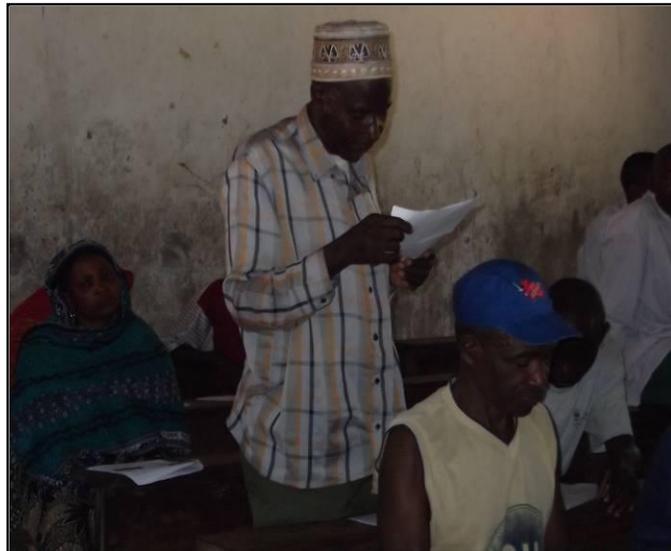
Based on the presentations, there were varying degrees of knowledge and understanding of dugong biology, distribution and current status. The surveillance and monitoring committees were more familiar due to the nature of their duties and were able to identify specific dugong feeding grounds. They were aware that dugong populations were declining and cited human activities that threaten dugongs including gillnet fishing, drift nets, prawn trawlers, dynamite fishing and pollution of the Rufiji River.

In contrast, the statistics committees were less familiar with the current status of dugongs and several committee members admitted that they did not know if dugong abundance was increasing or decreasing. Most participants knew that dugongs were reported to be caught in the Rufiji Delta but there was no connection made between an increase in human activities and decreasing dugong populations.

The workshops gave the participants a greater understanding of their roles within the CFMA and helped to create a new attitude towards endangered marine species conservation. Both committees recognised that CFMA's had a specific role to play in relation to dugong protection in the Rufiji Delta and agreed to incorporate dugong monitoring and protection into their daily work programmes.

Two follow up workshops were held in September 2011 to assess the progress of dugong monitoring and protection activities within NJISOPOJA and MBWEKIEKI CFMA's and determine the longer term impact of Sea Sense endangered marine species awareness workshops.

22 members from NJISOPOJA CFMA attended the workshop held in Jaja and 26 members from MBWEKIEKI CFMA attended the workshop held in Mbwera East. At the beginning of both workshops, each BMU sub-committee was asked to present a report of their activities and progress since they had attended a Sea Sense training workshop. At the end of each presentation, the rest of the participants were given the opportunity to ask questions to the presenting committee and provide suggestions on how the activities could be improved in the future.



***Plate 2: BMU progress report at MBWEKIEKI workshop***

The progress reports generated extensive discussions at both workshops as the participants were extremely interested to hear about activities and progress within their neighbouring BMU's. The reports revealed which BMU's were the most active and provided guidance to less active members who were able to recognise the need to improve their performance.

Most of the reports were of a good standard and committee members were able to elaborate on the details of their work activities when requested by other committee members. It was evident that many of the challenges faced by the CFMA committees were common to all committees and hence the participants were very keen to get clarification on how these challenges had been overcome. There were only two committees that did not produce a report: MBWEKIEKI Central Coordinating Committee and the statistics committee from Mbwera West BMU.

Following the progress reports, each of the committees was asked to provide feedback on how they had applied the knowledge and information from Sea Sense training workshops into their daily work programmes. The feedback was positive and committees agreed that Sea Sense training workshops had helped them to organise and manage their daily work schedules more effectively, improve relations with their communities and address challenges associated with CFMA implementation.

Both CFMA statistics committees stated that they had broadened the types of data they were collecting and improved their data collection techniques. There was a greater understanding of the

impact of illegal activities and the role of data collection in the monitoring of resource depletion. Many BMU's were able to determine the status of illegal activities in their area due to the collection of data on mangrove harvesting, coral mining and dynamite fishing. Data collected by the BMU's indicated that the frequency of illegal activities was higher in Pombwe and Somanga than in other villages. This may be due to the higher concentration of migrant fishers in Pombwe and Somanga who are often reported to be involved in illegal activities.

The surveillance committees stated that Sea Sense training workshops had helped them to improve their patrolling schedules and control information leakage more effectively. Furthermore, the committees admitted that their relationships with fishers had improved due to their changed approaches to eliciting information. Information was collected through discussions with fishers rather than through the use of force and cooperation had increased. Participants also agreed that collaboration between CFMA committees and village leaders had improved since the training and there was a greater understanding of the need to share information and cooperate in the planning of CFMA activities.

Following the Sea Sense workshops, the CFMA committees had incorporated monitoring of endangered marine species into their work programmes. Both the statistics and monitoring and surveillance committees had recorded data on sea turtle mortalities and reported sightings of humpback whales in the Rufiji Delta near to Pombwe, indicating that capacity to collect a variety of data had increased. There was also improved understanding of the important role of endangered marine species in the wider marine ecosystem. Kiechuru BMU had closed one seasonal fisher camp due to the persistent use of illegal fishing gears which posed a threat to sea turtles and dugongs.

Further training and education for CFMA leaders on the conservation of marine resources, particularly endangered marine species, is planned for 2012. Capacity building within CFMA's is a top priority for Sea Sense to improve understanding of the role of sea turtles and dugongs in the wider marine ecosystem and ensure the sustainability of sea turtle and dugong conservation strategies at a local level.

### **3.1.5 Dugong Workshop for Village Leaders in SOPOJA.**

The objective of the workshop was to improve knowledge and understanding of conservation efforts related to endangered marine species and to highlight the importance of strong leadership and frequent communications with BMU and CFMA committees. The workshop involved a series of lectures and discussions on sea turtle and dugong biology, their role in the marine ecosystem, their historical and current status, conservation initiatives and the impacts of human activities on their survival. The leaders were also provided with examples of how endangered marine species have the potential for income generation through ecotourism.



***Plate 3: SOPOJA village leaders awareness workshop***

Many of the leaders were aware that slaughter, nest poaching and illegal fishing threatened the survival of sea turtles but they had not considered any long term impacts of these activities. The issue of waste management was also introduced with particular reference to plastic waste and its impacts on endangered marine species.

There was a positive response to the workshop and leaders agreed to cooperate with Sea Sense and provide information whenever possible.

### **3.1.6 Dugong Bycatch Surveys**

Efforts to protect remaining populations of dugongs in Tanzania have been hampered by limited resources and capacity to conduct sophisticated surveys to determine their distribution and abundance. Some areas, known to support large populations of dugongs in the past, are data deficient and the true status of dugongs in Tanzania remains unknown.

To address these data gaps, a dugong questionnaire-based survey was developed under the auspices of the CMS-UNEP Dugong Memorandum of Understanding. The survey protocol was specifically designed to enable rapid implementation at low cost, to be implemented by non-specialised personnel following a brief training course and to capture data on other endangered marine species including sea turtles and dolphins. The survey incorporated a strong spatial component to enable identification of specific locations where potential threats from fisheries interactions persist.

The overall objective of the surveys was to determine the distribution and abundance of dugong population in data deficient areas. Specific objectives were to:

- Identify and map fishing effort in targeted areas
- Identify and map dugong critical habitat

- Determine dugong characteristics within targeted areas
- Identify and quantify threats to dugong habitat
- Identify the level of community awareness of dugongs
- Identify interaction between dugong sites and fishing areas

Surveys were conducted at two sites: Mkinga District which is located at the border with Kenya and in Mtwara District which is located at the border with Mozambique (Figure 3).



**Figure 3: Location of dugong survey sites in Tanzania**

Mkinga District was a previous stronghold of the dugong in Tanzania and was therefore a priority location for the survey. Dugongs have been occasionally sighted in this area and may be part of a population moving between Tanzania and Kenya.

Mtwara District was included in the survey due to the presence of extensive seagrass beds bordering Mozambique. Mozambique is known to support the largest population of dugongs in east Africa and there may be some movement between dugong populations in Mozambique and the Rufiji Delta, via Mtwara.

Mtwara and Mkinga Districts were considered to be data deficient in relation to current dugong populations. Interview surveys with fishers were conducted in Mkinga and Mtwara Districts in 2003 but since then no further data has been collected.

The surveys were conducted in collaboration with the Ministry of Livestock Development and Fisheries. The choice of survey sites was based on advice from officers of the Fisheries Development Division (FDD) and Marine Parks and Reserves Unit (MPRU). Selection criteria included:

- known presence of fishing communities

- high level of gill net use (source: 2009 Tanzania Marine Fisheries Frame Survey)
- presence of dugongs in previous years
- lack of up to date information on dugong distribution and abundance

Prior to the surveys, all surveyors attended a training session on the design and use of the questionnaire. Additional officers from MPRU and FDD also participated to build capacity for dugong conservation and protection in Tanzania. Topics covered in the training sessions included dugong and sea turtle biology and life history, historical and current status of dugongs in Tanzania and across their range, design of the questionnaire, interview techniques and data recording and management. The training consisted of a variety of learning media including presentations, DVDs, map reading skills, role plays and interview practices. A number of field pre-tests were also carried out at selected locations to identify any issues with the survey methodology prior to implementation.

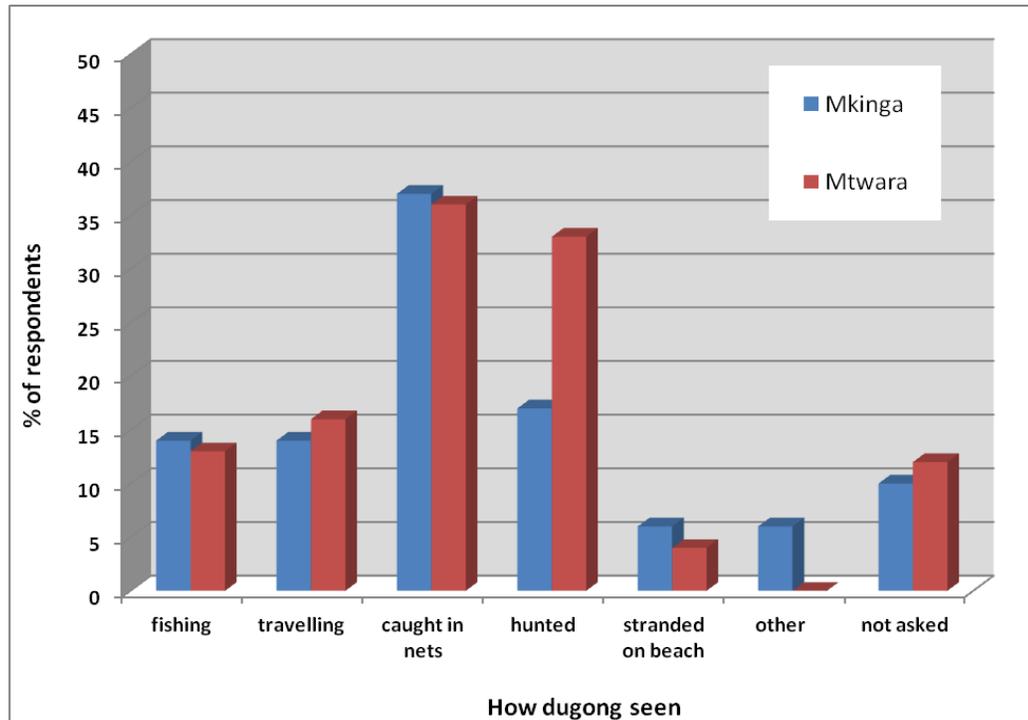
Surveys were conducted in five villages in Mkinga District (Yasini, Moa, Boma Subutini, Zingibari and Dumbani) and six villages in Mtwara District (Msimbati, Tangazo, Litembe, Kilambo, Ngwale and Msangamukuu). Fishers were randomly selected in each village and interviewed using the standardized questionnaire. Interviewees were asked to mark fishing grounds, dugong, turtle and dolphin observations and distribution of seagrass habitat on pre-prepared maps. A total of 172 questionnaires were completed in Mkinga District and 201 in Mtwara District.



**Plate 4: Interviewing a fisher in Mkinga District**

Results of the surveys conducted in Mkinga District indicated that dugongs were no longer present in the area in large numbers. 62% of respondents had never seen a dugong and many believed dugongs to be already extinct. 63 respondents (37%) had seen a dugong in their lifetime. The average age of respondents that had seen a dugong was 52 which correlated with the historical abundance of dugongs in this area. Most of the younger fishers had only heard of dugongs through conversations with older members of their family. Only one respondent had seen a dugong in the previous year.

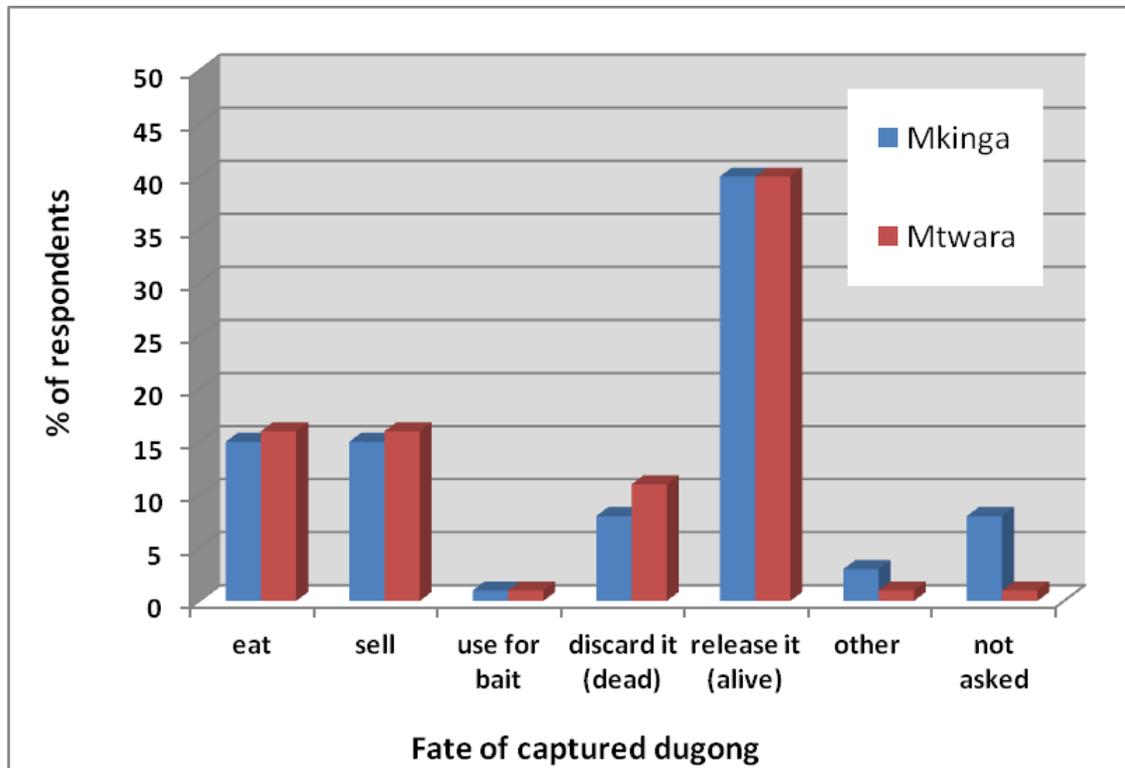
Similar results were recorded in Mtwara District. 65% of respondents had never seen a dugong. 67 respondents (33%) had seen a dugong in their lifetime and their average age was 50. Three respondents had seen a dugong in the previous year. At both locations, dugongs were most frequently observed entangled in nets (Figure 4).



**Figure 4: Response to question “how do you get to see dugongs?”**

Six respondents in Mkinga District claimed to have caught a dugong in their nets during the previous year. In Mtwara District, seven respondents caught a dugong in the previous year. It is possible that individual animals pass through waters in both Mkinga and Mtwara areas but they are unlikely to support viable populations.

Figure 5 shows the potential fate of captured dugongs at both survey sites. 40% of respondents claimed that they would release a captured dugong. However, the true figure is likely to be much lower as dugongs are considered a valuable source of protein and their meat can fetch a high price. Fear of apprehension for failing to release a captured dugong may have been driving the response to that particular question.



**Figure 5: Response to the question “What would you do with a dugong if you caught one?”**

There were similar myths and cultural beliefs about dugongs at both sites. Many of the respondents believed that dugongs were partly human and that a fisher must take an oath in front of village elders if a dugong is accidentally caught in his net.

A detailed report on the bycatch survey is currently being compiled by Sea Sense and the Fisheries Division and will be available directly from Sea Sense.

### **3.2 Sea Turtle Conservation**

#### **3.2.1 Sea Turtle Nest Monitoring and Protection**

A total of 379 nests were recorded in 2011. 375 nests were laid by green turtles and four by hawksbill turtles.

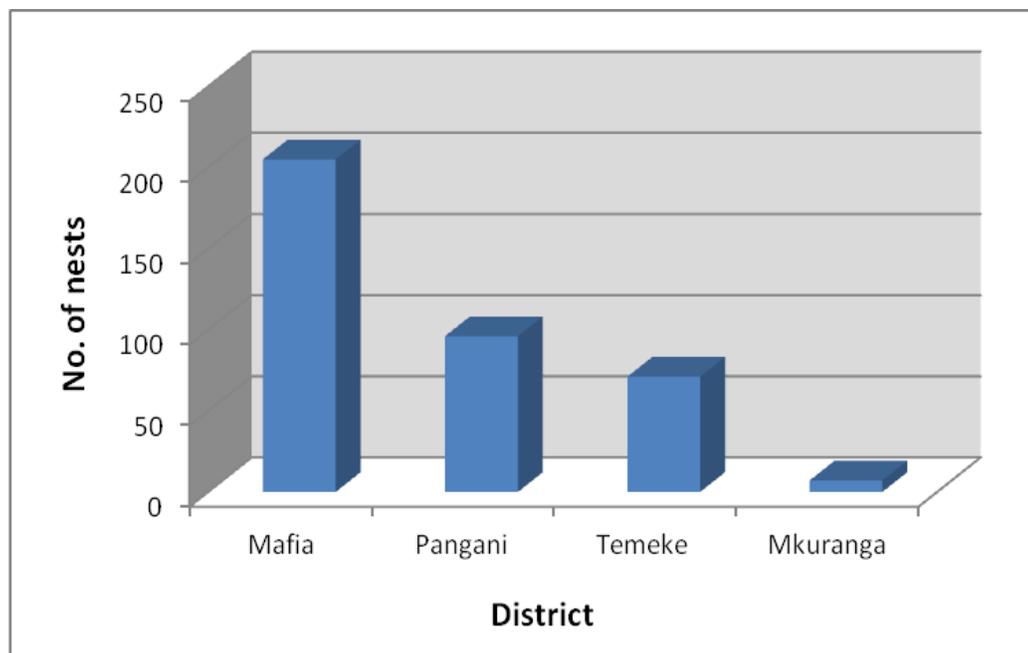
338 hatched successfully and produced 31,541 hatchlings. The average hatching success rate for green turtle nests was 74% and for hawksbills nests was 80%.

In addition, 22 green turtle nests that were laid in 2010 hatched in early 2011, producing 1,912 turtle hatchlings.

Seven nests were still incubating at the end of 2011 and were due to hatch in early 2012.

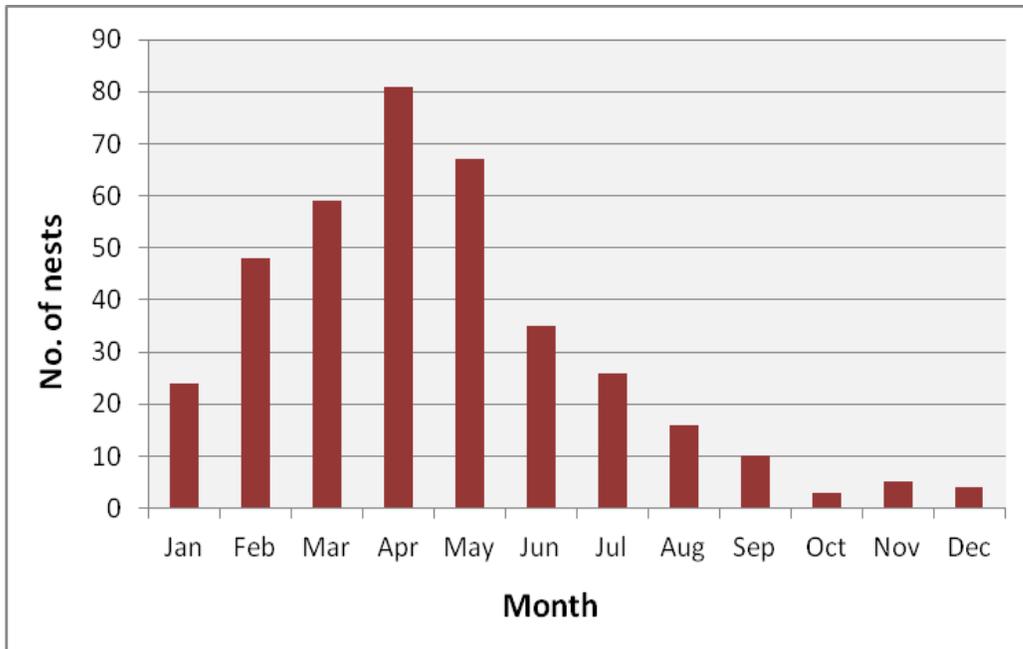
34 nests did not hatch. Eight nests rotted, three were poached (all in Mafia District), eight were inundated by the high tide and 15 were predated. Monitor lizards were the most common predator and are known to target incubating eggs. They were responsible for all predation events in Mafia Island (n: 9) and partially predated one nest in Temeke District. Red ants pose a considerable threat to emerging hatchlings and predated six nests in Temeke District.

Mafia Island continues to be the most important nesting site for green and hawksbill turtles in Tanzania. More than half (n: 205) of all nests recorded in 2011 were laid there. Temeke and Pangani Districts also support significant nesting populations. Figure 6 shows the distribution of nests laid in 2011.



**Figure 6: Location of sea turtle nests recorded by Sea Sense in 2011.**

Green turtles nest on Tanzania’s beaches all year round. In 2011, peak nesting activity was in April. 81 nests were recorded. Figure 7 shows the seasonality of green turtle nesting (data taken from all sites monitored by Sea Sense).

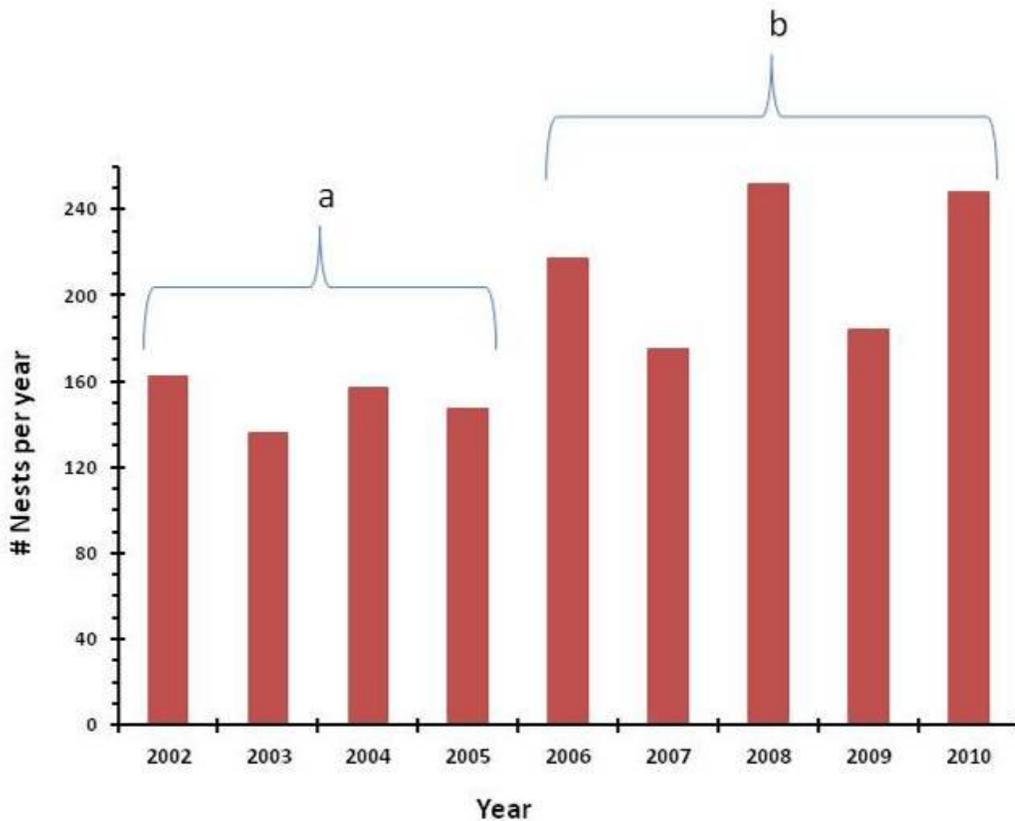


**Fig 7: Seasonality of green turtle nesting in Tanzania, 2011**

Since 2001, 3,052 nests have been recorded and monitored by Sea Sense and 224,870 hatchlings have safely reached the sea.

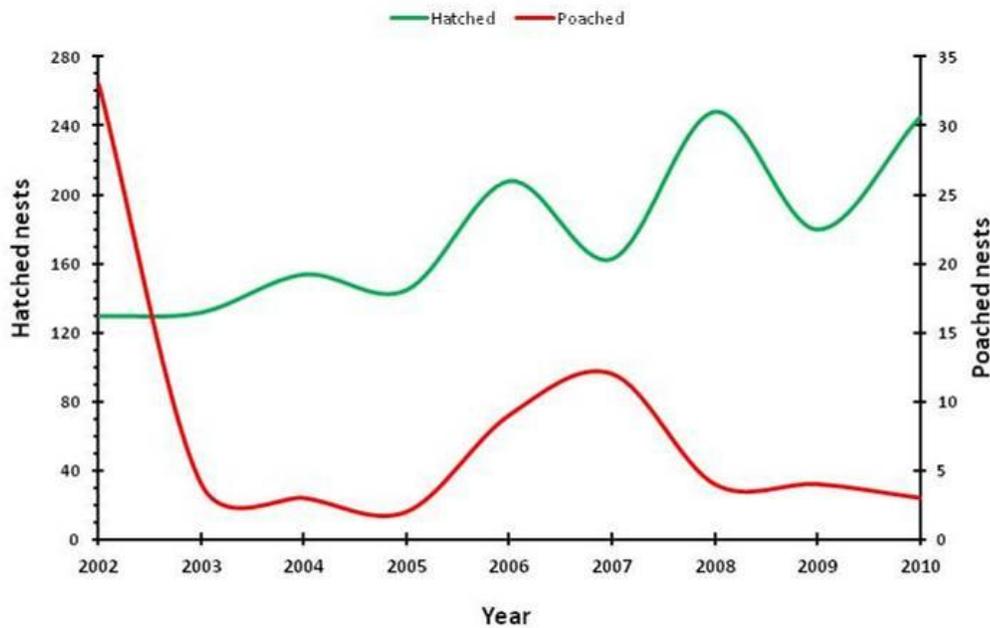
In 2011, the sea turtle monitoring programme in Mafia District celebrated its 10<sup>th</sup> year. Since the monitoring programme began in 2001, 1,179 nests have been recorded in Mafia with an average of 175 (SD±55) nests laid per year.

Two thirds of all recorded nests were laid in Juani Island, a small island to the southeast of Mafia. Over the past ten years, seven nesting beaches averaging 200 metres in length have been actively monitored in Juani. There was a significant increase (ANOVA test,  $p < 0.001$ ) in the annual number of nests recorded in Mafia Island between 2002 and 2010 (Figure 8).



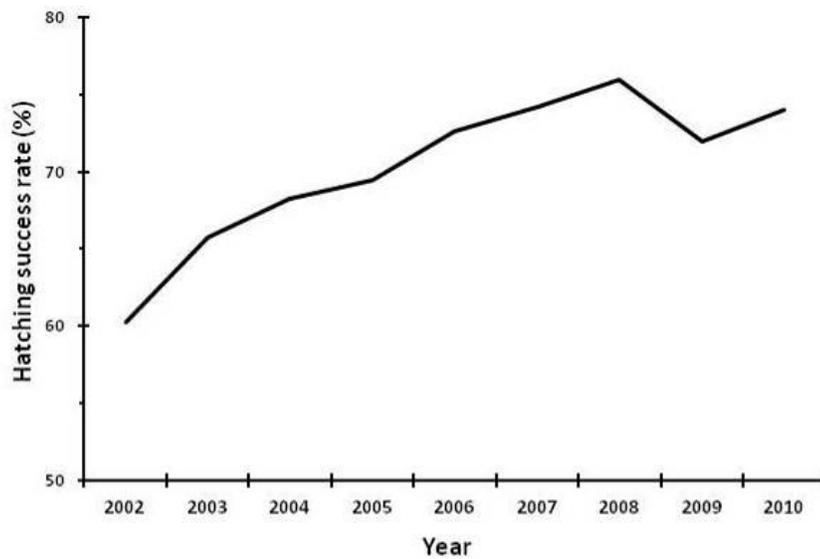
**Figure 8: Number of nests recorded per year, 2002 – 2010 in Mafia Island. a and b represent significant differences (ANOVA test,  $p < 0.001$ )**

Levels of poaching decreased dramatically following implementation of the nest monitoring programme. In the first year of monitoring, 47% of nests were poached. This figure decreased to 20% in year two and 2% in year three. The rate of poaching has remained at 3-4% for the past seven years (Figure 9).



**Figure 9: Number of hatched and poached nests in Mafia Island, 2002 - 2010**

Hatching success rates increased over time (Figure 10). This increase can most likely be attributed to the reduction in poaching and improved nest translocation techniques.



**Figure 10: Hatching success rates in Mafia Island, 2002 - 2010**

### **3.2.2 Sea Turtle Tagging**

An intensive flipper tagging programme was planned for April and May 2011, during the peak nesting season. However due to delays with funds and the production of tags in Australia, tagging was only conducting during the last 20 days of May.

Six Sea Sense Conservation Officers and four members of Juani community attended a tagging training workshop. The training consisted of a one day theoretical training session focusing on sea turtle biology and handling and tagging protocols followed by a one day practical session in Juani.



***Plate 5: Flipper tagging training, Mafia District***

The four most important nesting beaches in Juani (Kishiko Kikubwa, Jiwe la Mzungu, Mvinjeni and Yuyuni) were targeted for the tagging programme. A team of two people, comprising one Conservation Officer and one community member, patrolled the beach during the hours of 7pm and 6am. Each team was issued with the necessary field equipment including flipper tags and a tag applicator, a disposable camera, tape measure, torch, bucket, towel, gloves, rain coats and a tent. Turtles were tagged following egg deposition and covering of the nest to prevent any disturbance during the nesting process. The curved carapace length (CCL) and curved carapace width (CCW) were taken and the turtle examined for any evidence of previous tagging. Each tagged turtle was photographed to show the tag numbers and confirm that tagging had been completed.



**Plate 6: Green turtle showing location of flipper tag**

Table 1 shows tagging data collected in May. Eight sea turtles were tagged (t), each with two tags to take account of tag loss.

Species	Date	Location	Tag Numbers	CCL	CCW	Status	Remarks
Green	12/05/2011	Mvinjeni	TZ009 & TZ010	103	93	T	Nesting
Green	15/05/2011	Mvinjeni	TZ011 & TZ012	102	98	T	Nesting
Green	15/05/2011	Yuyuni	TZ017 & TZ018	108	97	T	Nesting
Green	17/05/2011	Yuyuni	TA 153	109	99	S	False crawl
Green	17/05/2011	Yuyuni	TZ019 & TZ020	109	99	T	Nesting
Green	18/05/2011	Mvinjeni	TA153	109	99	S	False crawl
Green	18/05/2011	J. Mzungu	TZ001 & TZ002	104	97	T	Nesting
Green	18/05/2011	J. Mzungu	TZ003 & TZ004	110	104	T	Nesting
Green	19/05/2011	Yuyuni	TA153	109	99	S	Nesting
Green	21/05/2011	J. Mzungu	TZ005 & TZ006	105	101	T	Nesting
Green	21/05/2011	J. Mzungu	TZ007 & TZ008	107	109	T	Nesting
Green	23/05/2011	Mvinjeni	TZ009 & TZ010	130	93	S	Nesting

**Table 1: Tagging data, May 2011**

One previously tagged turtle was sighted (s) nesting. TA153 was first tagged on 11<sup>th</sup> May 2004 when she nested on Kishiko Kikubwa beach.

An intensive tagging programme is planned in Juani Island, Mafia District, during the eight week nesting peak in 2012. The objective of the intensive tagging programme is to collect data on the

status of the nesting population in Juani, identify intra-nesting durations, clutch frequencies, levels of nest site fidelity and post nesting migratory periods. Such information is vital to the development of effective sea turtle management strategies.

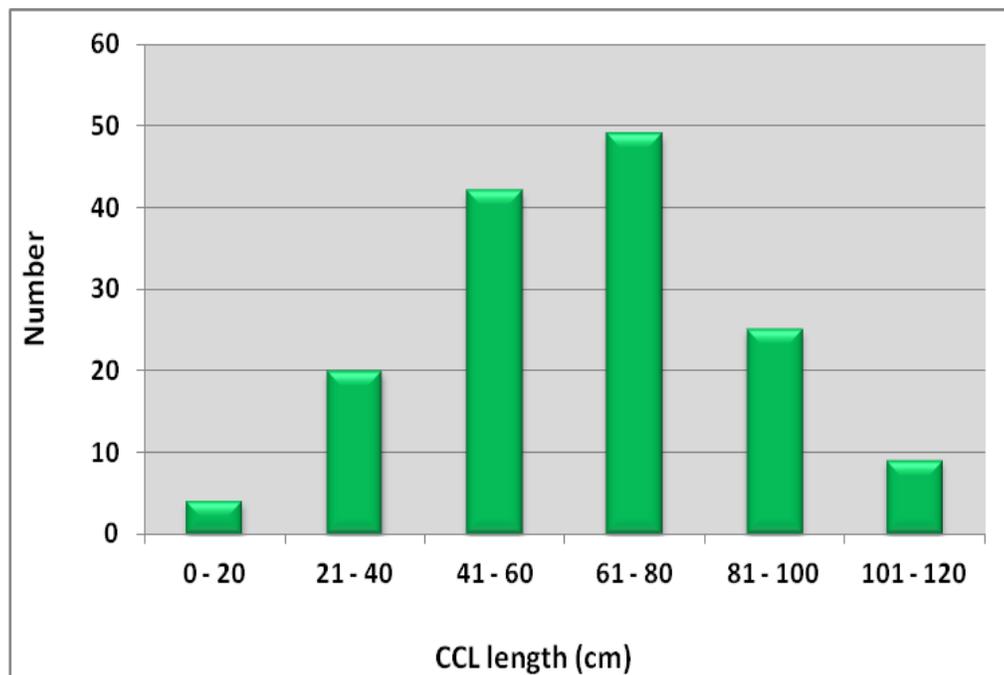
### 3.2.3 Sea Turtle Mortalities

In 2011, 166 dead turtles were recorded washed up on Tanzania’s beaches or found floating at sea. Based on carapace determination, 156 mortalities were green turtles, eight were hawksbill, one was an olive ridley and one was unidentified. Table 2 shows sea turtle mortality data collected by Sea Sense in 2011.

Location	Green	Hawksbill	Olive ridley	Unidentified	Total
Temeke	52	1	0	0	53
Mkuranga	3	1	0	0	4
Rufiji	54	6	1	0	61
Kilwa	4	0	0	0	4
Mafia	2	0	0	0	2
Pangani	41	0	0	1	42
<b>Total</b>	<b>156</b>	<b>8</b>	<b>1</b>	<b>1</b>	<b>166</b>

**Table 2: Sea Sense Turtle Mortality Data, 2011**

The curved carapace length (CCL) of the stranded green turtles ranged from 15cm to 115.5 cm with an average of 62.3cm (SD±23). Figure 11 shows the size - frequency distribution of CCL’s amongst the stranded green turtles.



**Figure 11: Size frequency distribution for stranded green turtles in 2011**

The majority of CCL measurements were well below average carapace length for breeding green turtles (CCL 95cm) which suggests that Tanzanian waters are an important foraging ground for juvenile green turtles but pose a significant threat to their survival.

It is only possible to determine the sex of adult sea turtles (CCL>95cm). Of the adult mortalities (n: 16), nine were female, six were male and in one case the sex was indeterminable.

Many of the stranded turtles showed evidence of knife injuries to the head and some had had their flippers cut off. Many of the mortalities were the result of deliberate slaughter and only the carapace remained.

The first reported case of fibropapilloma in Tanzania was recorded in October 2011. The disease is caused by a virus and is commonly found in juveniles and sub-adults. Green turtles are the most commonly affected species. Afflicted turtles develop benign cauliflower-like tumours on their soft and hard tissues, both internally and externally. The tumours are highly variable in size, ranging from small spots to large growths weighing upwards of three pounds. The growths may become so large that they obstruct the turtle's eyes and mouth. Large growths on flippers can impede swimming.

A green turtle in Temeke District was reported stranded on the beach and had numerous tumours around the neck region and fore flippers.



***Plate 7: Fibropapilloma in a stranded green turtle, Temeke District, October 2011***

Sea turtle stranding data is being used to identify communities who frequently slaughter sea turtles so that details can be reported to the appropriate authorities for action. Data is also helping to ensure education and awareness programmes target those communities who repeatedly participate in this illegal activity.

### **3.2.4 Sea Turtle Ecotourism**

Due to the presence of a number of hotels in the vicinity of sea turtle nesting beaches in Mafia, Pangani and Temeke Districts, Sea Sense has developed a sea turtle ecotourism initiative to generate a sustainable source of revenue for sea turtle conservation and local community development projects. Visitors are guided to nesting beaches by Turtle Tour Guides who have been recruited from the local community and received training in sea turtle biology, communication skills and visitor management. Visitors are able to witness sea turtle hatchlings emerging from their nest and learn about sea turtle conservation efforts in Tanzania.

#### **Ecotourism Infrastructure**

Access routes were cleared to Mvinjeni and Jiwe la Mzungu nesting beaches in Juani, Mafia Island, with the help of the local community. Members of Juani community also assisted Sea Sense in the construction of a beach shelter at Kishiko Kikubwa beach. Construction of the shelter took three days.



***Plate 8: Shelter construction, Juani Island***

On completion of the shelter, Sea Sense staff visited each of the hotels to inform hotel managers that a shelter was available for their guests to rest and picnic.

Large amounts of litter and plastic debris continued to be a problem on nesting beaches in Juani. Visitors to Juani complained repeatedly about the amount of litter and plastic waste on both the access routes and on the turtle nesting beaches. To address this issue, a meeting was held between Juani village council, Mafia Island Marine Park and Sea Sense. Juani leaders were reminded that the community were stakeholders in the sea turtle ecotourism initiative and had a duty to assist in delivering a professional and quality experience. The council agreed to mobilise the community and keep nesting beaches clear of litter and plastic debris. It was also agreed that if Juani failed to keep

their commitment then a proportion of the sea turtle ecotourism revenue would be withheld to fund a regular beach clean-up team.

### **Income Generation**

During 2011, sea turtle ecotourism generated important revenue in five coastal communities in Tanzania: Mafia (1), Temeke (2) and Pangani (2). The mode of revenue collection was agreed with key stakeholders at each location.

Hoteliers in Mafia District agreed to donate \$10 per adult and \$5 per child to Sea Sense for each excursion to a sea turtle nesting beach. The revenue is collected by each hotelier and then transferred to Sea Sense on a six monthly basis.

Many visitors to turtle nesting beaches in Temeke were residents of Dar es Salaam undertaking a day trip to witness a turtle hatching event. Sea Sense formed a link with a local safari operator, Authentic Tanzania, in Dar es Salaam to promote sea turtle ecotourism in Temeke District. Authentic Tanzania offer trips to watch turtle hatchings and donates 40% of the cost of each excursion to Sea Sense. Sea Sense and Authentic Tanzania produced a flier to promote sea turtle viewing which was distributed widely in Tanzania. Their staff received training from Sea Sense in turtle biology and conservation and were issued with the Sea Sense Endangered Species Training Manual. In 2011, Authentic Tanzania raised \$1,350 for Sea Sense.

A number of guests participated in sea turtle ecotourism in Temeke District independently. In such cases, payment was made at the Sea Sense office prior to the hatching event.

In Pangani District, Sea Sense is collaborating with a dive operator near to Ushongo village to promote sea turtle ecotourism. Many visitors made voluntary donations which were collected by the dive operator and used to fund a patrol boat and fuel to Maziwe Island to translocate the nests which would otherwise have been inundated by the high tide.

Table 3 shows total income generated from sea turtle ecotourism at each location during 2011.

<b>Village</b>	<b>District</b>	<b>Income (\$)</b>
Amani Gomvu	Temeke	2,268
Kimbiji	Temeke	430
Juani	Mafia	2,830
Ushongo	Pangani	N/A
<b>TOTAL</b>		<b>5,528</b>

**Table 3: Ecotourism income generation, 2011**

Half of all revenue from sea turtle ecotourism was donated to 'Village Environment Funds' established by Sea Sense in villages close to turtle nesting beaches. Village leaders were requested to communicate this information to the wider community to ensure that the community was aware of

the economic benefits of sea turtle conservation. In 2011, TSh 3,975,000 was donated to villages in Mafia, Temeke and Pangani Districts.

To raise further income through ecotourism, a local artist designed a turtle t-shirt for Sea Sense. The t-shirt is now on sale at several outlets including lodges in Mafia and a dive centre in Dar es Salaam. Adult t-shirts are sold for \$15 and children's t-shirts are sold for \$10.

Since September 2011, t-shirts sales have raised \$1,615.

### **Marketing of Sea Turtle Ecotourism**

Sea Sense produced a document entitled 'Sea Turtle Ecotourism: Guidelines for Development'. The document sets out the key objectives of sea turtle ecotourism in Tanzania and identifies opportunities and challenges for the initiative. The document was circulated to several stakeholders for comment including Tanzania Tourist Board, local tour operators, tourism marketing consultants and WWF.

The document formed the basis of a one day sea turtle ecotourism workshop held in Arusha in June 2011 to coincide with the annual Karibu Tourism Fair. Sea Sense invited six experts in the field of ecotourism and marketing to attend and discuss sea turtle ecotourism with a view to providing advice and guidance for the long term success and sustainability of the initiative.



***Plate 9: Sea turtle ecotourism workshop, Arusha***

The workshop was extremely valuable and the participants provided some very important feedback and ideas to help Sea Sense market sea turtle ecotourism more effectively.

The Sea Sense Coordinator attended a one day training course entitled 'E-Tourism' which covered all aspects of marketing tourism online. E-marketing is widely regarded as the most effective form of marketing and enables tourism providers to access potential visitors while still in the planning phase of their trip.

Sea Sense met with the Sales and Marketing Manager of the [www.mydestination.com](http://www.mydestination.com) Tanzania franchise. The manager generously donated a years' worth of advertising (worth USD 1,700) on the Tanzania section of the [www.mydestination.com](http://www.mydestination.com) website. The promotional article can be found at: <http://www.mydestination.com/tanzania/travel-articles/72356/sea-sense>

Sea Sense has developed working relations with several members of the tourism sector who have helped to publicise sea turtle ecotourism. Mafia Island Lodge included a detailed article about sea turtle ecotourism opportunities in their latest newsletter and a tour operator called 2Tanzania has also promoted sea turtle ecotourism in their newsletter and website.

### 3.2.5 Turtle Nest Adoption Scheme

Sea Sense promotes a sea turtle nest adoption scheme to generate further revenue to support sea turtle conservation activities. A sea turtle adoption pack has been produced which contains an adoption certificate, a sea turtle poster, photographs of hatchlings, a children's puzzle page and a bookmark. The pack provides information on sea turtle biology and life history, sea turtle conservation in Tanzania and the role of communities in sea turtle protection.

A sea turtle adoption costs \$50. During 2011, 51 nests were adopted, generating \$2,550.

### 3.3 Whale Shark Conservation

There have been no specific conservation activities related to whale sharks during 2011 due to availability of funds.

### 3.4 Cetacean Conservation

#### 3.4.1 Cetacean Mortalities

Sea Sense Conservation Officers collect data on cetacean mortalities during their daily patrols. During 2011, seven mortalities were recorded, as shown in Table 4.

Date	District	Location	Species	Length (cm)	Width widest point (cm)	Sex	Comments
06/02/2011	Rufiji	N/A	Unidentified dolphin	203	52	F	Stranded
04/03/2011	Rufiji	N/A	Unidentified dolphin	244	58	F	Stranded
04/04/2011	Rufiji	Mbwera	Whale (humpback)	450	195	N/A	Stranded
04/05/2011	Rufiji	Jaja	Unidentified dolphin	256	62	M	Stranded
23/05/2011	Rufiji	N/A	Unidentified dolphin	320	56	F	Stranded
04/08/2011	Rufiji	Kipeta Msala	Whale (humpback)	455	188	N/A	N/A
14/08/2011	Rufiji	Pombwe	Unidentified dolphin	355	71	F	Stranded

**Table 4: Cetacean mortalities recorded by Sea Sense in 2011**

### **3.5 Community Participation**

#### **3.5.1 Conservation Officers**

During 2011 the Sea Sense Conservation Officer (CO) network comprised 34 CO's in six coastal districts. CO's operated in Mafia (6), Temeke (13), Mkuranga (4), Pangani (5), Rufiji (4) and Kilwa (2). Their duties included conducting daily patrols to collect data on endangered marine species, monitoring and reporting illegal activities and raising awareness in their communities.

In September 2011, a further two CO's were recruited in Stahabu and Kipumbwi villages in Pangani District.

A refresher training session was held with CO's in Rufiji and Kilwa in June. Topics covered included sea turtle and dugong biology, threats to endangered marine species, procedures for conducting Sea Sense patrols, monitoring and reporting of illegal activities, ecotourism opportunities, data collection strategies, feedback to village councils and waste management.

There were also extensive discussions on strategies to engage CFMA members in dugong conservation. CO's were reminded about the significance of their role in the wider community and the importance of developing good working relationships with village councils so that regular feedback can be given to the community during village assembly meetings.

#### **3.5.2 Sea Turtle Nest Incentive Scheme**

Sea Sense operates a nest incentive scheme whereby small financial incentives are given to villagers who report sea turtle nests. Incentives consist of a founder incentive of TSh 5,000 together with TSh 100 for every egg that hatches successfully and TSh 50 for every egg that fails to hatch. The scheme has proven to be a successful way of involving local communities in sea turtle conservation and enhancing perceptions of the value of live sea turtles.

During 2011, a total of TSh 5,645,500 was paid to local communities through the nest incentive scheme.

#### **3.5.3 Village Meetings**

Regular meetings were held in all villages where Sea Sense is currently conducting marine conservation activities to elicit support for project activities and ensure that communities remain fully aware of and engaged in Sea Sense activities. Issues relating to endangered marine species conservation, illegal fishing, coral mining, mangrove cutting and sea cucumber exploitation were discussed.

Meetings in Somanga and Kilwa Kivinje (Kilwa District) focused on providing an overview of Sea Sense aims, objectives and projects since many of the members were newly elected and did not have any knowledge of Sea Sense work. There was also limited understanding of the term ‘endangered marine species’ with many members asking why there was a need to conserve sea turtles and dugongs. Sea Sense gave detailed explanations about the historical and current status of these species and answered several questions about Sea Sense efforts to conserve them. Sea Sense t-shirts were distributed to each council member.



**Plate 10: Village council meeting in Kilwa Kivinje**

Sea Sense also introduced the subject of waste management and explained how poor disposal of waste can impact the marine environment. Council members were extremely interested in this topic; particularly the effects of plastic waste on human health and asked for further advice on how waste could be managed.

At the end of the meeting in Kilwa Kivinje, the village chairperson read a village report regarding progress in marine protection and strategies they had implemented to fight against illegal activities. From his report it showed that they had managed to make some progress in the fight against dynamite fishing by holding regular awareness meetings with fishers. However, there was little progress in relation to curbing illegal slaughter of sea turtles.

Almost all of the village council members at the Somanga meeting stated that they were unaware of the 2009 Fisheries Regulations, although this is unlikely to be true considering the level of training and awareness already undertaken by WWF and Sea Sense. Sea Sense reminded the members that BMU implementation is part of the Fisheries Regulations so cooperation is needed. However, members would not agree and stated that they would hold their own discussions on the matter.

Sea Sense held a village council meeting in Jibondo Island in Mafia District together with the Ward Representative. Jibondo Island is within Mafia Island Marine Park (MIMP) but the community does

not cooperate with MIMP or engage in any conservation activities. It is a known nesting site for sea turtles but there are thought to be high levels of sea turtle slaughter and consumption.

Sea Sense provided background information on project activities and explained the importance of conserving and protecting endangered marine species. However, Jibondo village council leaders had a poor attitude towards protection and conservation of marine resources and were unwilling to engage in discussions about conserving sea turtles in Jibondo. Some council members admitted that they themselves were involved in sea turtle slaughter and nest poaching and stated that they were usual activities within the Jibondo community. They stated that they were not interested in laws and regulations which protect endangered marine species and their products.

After embarking on long discussions with lots of examples, some of the village leaders became more aware and began to understand the conservation significance of sea turtles. Council members assured the Ward Representative that they would discuss the issue at their monthly village assembly meeting and provide feedback on their decision as a whole village community after 30<sup>th</sup> June 2011. However, despite repeated follow ups, Jibondo village council refused to enter into any further discussions regarding participation in a sea turtle conservation project.

### **3.6 Training**

#### **3.6.1 Participatory Video on Dynamite Fishing**

In February, Sea Sense joined forces with Sand County Foundation, WWF and Youth Vision Kigamboni to make a documentary about the impacts of dynamite fishing in Buyuni village, Temeke District. The film was produced using a technique called 'Participatory Video' whereby villagers were trained in the use of cameras, tripods and microphones, interviewing, filming and editing. In this way the villagers were able to explore issues relevant to them and document their own stories.

10 village leaders in Buyuni were trained and conducted numerous interviews and discussions with members of their community who had been affected by dynamite fishing including an interview with a fisherman who had lost both his arms in a dynamite fishing accident. The material was edited and the final version was shown to the community during an evening awareness raising event. Sea Sense has since shown the film in several other villages along the coast to encourage communities to take action against dynamite fishing.

#### **3.6.2 Teacher Training Workshop**

Environmental education is non-existent in many schools along the coast due to limited knowledge amongst education providers. In April, Sea Sense conducted a teacher training workshop for primary school teachers in Pangani District to equip them with skills and knowledge to take back to their classrooms.

32 teachers from 16 schools attended the three day workshop which included a series of lectures, presentations, environmental games and field trips. The teachers learnt how to design their own lessons plans and deliver creative and interactive education programmes with only minimal resources.



**Plate 11: Teachers share ideas during a lesson planning exercise**

Each school will be visited by Sea Sense staff in 2012 to assess the impact of the training workshop and provide support for the teachers to continue delivering environmental education programmes.

### **3.6.3 Handicrafts Training**

To reduce pressure on critical marine resources, Sea Sense works closely with local communities to develop alternatives to unsustainable fishing practices that threaten the survival of endangered sea turtles and dugongs. In November 2010, a group of 40 women were trained in grass cutting, dying and weaving to develop local handicrafts for sale to visitors participating in sea turtle ecotourism.



A follow up training workshop was held in April 2011. The women were trained in the use of a wider range of handicrafts materials and taught how to produce additional products including baskets and purses. Some of the products have been sold to other families in the village. The project is helping to generate important revenue for the community and is supporting Sea Sense efforts to engage the wider community in marine conservation and protection.

**Plate 12: A sample of the products being produced in Juani**

After the training session the handicrafts group were invited by Mafia District Council to attend a 'Women's Day' celebration in Kilindoni where they were able to sell some of their products. They were awarded a certificate by the District Commissioner for the best handicrafts group in Mafia District. The women have since received training from Mafia District Council in entrepreneurial skills including marketing, pricing and management of revenue.

In October, Sea Sense invited Mafia Island Marine Park (MIMP) staff and the Mafia Community Development Officer to meet with Juani women's handicrafts group. The aim of the visit was to monitor their progress and to encourage them to continue producing quality handicrafts for sale to local communities and visitors to Mafia.

The group reported that they had produced a large range of woven products many of which had already been sold and they were also receiving additional orders. The group produced and sold baskets for TSh 7,000 to 10,000 and small purses for TSh 3,000 to 5,000. The group requested a dedicated area to display and store their materials and products.

#### **3.6.4 Sea Turtle Training for the Tourism Sector**

In March, Sea Sense visited Fanjove Island in Kilwa District, following notification that a number of green turtle nests had been laid there during 2010. The island is currently being developed by a tour operator and there were a number of security guards present on the island who had reported the nests. Due to their low level of knowledge and understanding of sea turtle biology, several of the nests that they reported in 2010 had failed due to inundation by the tide.

To improve survival rates of future nests, Sea Sense provided practical training sessions to develop skills in nest identification, translocation protocols, post hatching excavations, and hatching Codes of Conduct. This training was backed up by theoretical training in sea turtle biology and life history. The trainees were provided with a number of ID charts, fact sheets and turtle posters. 10 guards participated in the training.



***Plates 13 & 14: Theoretical training (left), practicing nest translocation techniques (right)***

Sea Sense will continue to conduct routine visits and communicate with staff to support the progress of sea turtle monitoring in Fanjove Island.

In March, Sea Sense also provided training for eight staff at *Mnemba Island Lodge* in Zanzibar which supports an important population of nesting green turtles. Staff at Mnemba have monitored the sea turtle population since 2001 which makes it one of the longest running sea turtle monitoring programmes in Tanzania. Training in nest identification, nest translocation protocols, flipper tagging, nest excavations and sea turtle viewing Codes of Conduct was provided to new staff.

In July, 15 staff at *Saadani Safari Lodge* received both theoretical and practical training in sea turtle biology and conservation. Efforts were focused on the management of sea turtle ecotourism since green turtles nest near to the lodge and managers were interested in providing sea turtle watching experiences.

In November, six staff at *A Tent With A View* in Saadani also received training in sea turtle conservation and ecotourism.



**Plate 15: Training for staff in the tourism sector**

### **3.6.5 Bycatch Awareness Training**

Bycatch in artisanal and commercial fishing gears poses the single biggest threat to sea turtle survival on a global scale. In Tanzania, entanglement in artisanal gill nets is a significant threat to foraging and migrating sea turtles.

Sea turtle stranding data shows that there is a high incidence of gill net entanglement around Sange in Pangani District. In July, Sea Sense held a bycatch awareness training session for a group of gill net fishers from Sange village with the aim of raising awareness of the threat to sea turtles from fisheries interactions and providing training in simple techniques to release live sea turtles from fishing nets.

The group requested the training from Sea Sense because they had already participated in Sea Sense endangered marine species awareness activities and therefore had a good understanding of the need to conserve sea turtles. However, many were afraid of being taken to court if they reported an entangled sea turtle and some confessed to killing entangled sea turtles immediately.

10 fishers participated in the training and were provided with basic information about sea turtle biology to improve understanding of how net entanglement can kill sea turtles. They were then advised on how to release an entangled sea turtle depending on the size of the turtle and the number of boat crew available to assist.

### 3.6.6 Mnazi Bay-Ruvuma Estuary Marine Park (MBREMP)

The Mnazi Bay – Ruvuma Estuary Marine Park (MBREMP) is located to the south of Mtwara town in southern Tanzania, including the last 45 kilometres of coastline to the Ruvuma River forming the border with Mozambique. MBREMP provides important foraging grounds for all five species of sea turtle found in the Western Indian Ocean: green (*Chelonia mydas*), loggerhead (*Caretta caretta*), olive ridley (*Lepidochelys olivacea*), hawksbill (*Eretmochelys imbricata*), and leatherback turtles (*Dermochelys coriacea*). There is also a small but critical population of nesting green turtles within MBREMP which utilise beaches in the southern part of the Park.

WWF Tanzania Country Office (WWF-TCO) has been implementing a project ‘Community Development and Sustainable Management of Marine Resources’ in MBREMP since 2007 and identified an opportunity to improve sea turtle conservation and protection within the park and increase community participation in a sea turtle monitoring programme. Sea Sense was engaged on a consultancy basis to provide training and strengthen capacity for sea turtle monitoring within MBREMP.



Sea Sense, in collaboration with MBREMP staff, held village council meetings in three villages: Msimbati, Tangazo and Litembe which were all considered to be key stakeholders in sea turtle conservation within MBREMP. Following the village council meetings, full village assembly meetings were held in each village to gain a clearer understanding of community perceptions of sea turtles, improve understanding of the critical role of sea turtles in the wider marine ecosystem and strengthen relations between the communities and MBREMP.

**Plate 16: Msimbati village assembly meeting**

A three day training session focusing on sea turtle conservation was held in November 2011 and included both theoretical and practical components. Community Turtle Officers (CTO's) and village leaders from Msimbati, Litembe and Tangazo were invited to attend together with relevant MBREMP staff. 17 people attended the training: four CTOs from Msimbati and Litembe villages, five newly elected CTOs from Msimbati (two), Litembe (two) and Tangazo (one) villages, five village leaders from Msimbati, Litembe and Tangazo villages and three MBREMP staff members. The training was delivered by the Sea Sense Education Officer and Field Officer.

The Sea Sense team gave a presentation on marine ecosystems and explained the interdependency between species and habitats. The role of endangered marine species such as sea turtles and dugongs within the marine ecosystem was also discussed. The participants were given detailed information on sea turtle biology and life history including species names, local and common names, habitats, diets and life cycles (nesting, foraging and migration patterns).

With a clearer understanding of the sea turtle life cycle, participants were able to understand the importance of an effective nest monitoring programme. Practical field conservation techniques were introduced which included locating a sea turtle nest, species identification from nesting tracks, techniques to establish the location of the nest chamber, nest translocation protocols, post hatching excavations and flipper tagging. Participants were given the opportunity to ask questions and clarify details of the field techniques.

Practical training was conducted at Ruvula and Msimbati sites. At the start of the practical training, the participants and the Sea Sense team conducted a beach patrol to assess the features of the beach which made it suitable for nesting sea turtles.

The participants then gathered for a recap on the practical skills that had been introduced and discussed during the theory sessions. Each participant was required to practise identifying a nest, translocating it to a safer area and excavating it to determine hatching success.

After each of the skills had been perfected, the participants were taken to an area near to Msimbati where sea turtles are regularly slaughtered for consumption. More than 60 fresh carapaces were counted. The existence of this site was a shock to some of the participants and helped to reinforce the need for a sea turtle conservation strategy in MBREMP.

Sea Sense assisted MBREMP staff with the development of an appropriate work plan for the sea turtle conservation programme and associated activities for 2012. Four MBREMP staff participated in the development of the plan. The work plan included a timetable for beach patrols, monitoring meetings with CTO's, village meetings and awareness activities. The work plan will facilitate the timely management of programme activities and enable effective monitoring of the progress of sea turtle conservation in MBREMP.

### **3.6.7 UDSM Students**

Between August and October, two students from the University of Dar es Salaam completed an eight week placement at Sea Sense. The students participated in dugong bycatch surveys in Mkinga

District, CFMA training workshops in Rufiji and Kilwa Districts and met with Conservation Officers in Temeke District to learn more about practical sea turtle conservation techniques.

The students also undertook several administrative tasks in the Sea Sense office including a desk study of regional dugong conservation strategies and entry of bycatch data.

### **3.7 Education and Awareness**

#### **3.7.1 World Environment Day**

In keeping with Sea Sense efforts to raise awareness of the importance of a clean and healthy marine environment, a community clean up day was organised in Mafia District to coincide with World Environment Day on June 5<sup>th</sup>. Clean up activities were conducted in Kilindoni, Kigamboni and Kulungeni, in collaboration with local environmental conservation groups. A truck was organised to transport the collected waste to a landfill site designated by Mafia District Environmental Management Officer. More than seven truckloads were collected. There was a lot of interest in the activity and high participation amongst the local community.



***Plates 17 & 18: Community clean-ups in Mafia District on World Environment Day***

#### **3.7.2 World Sea Turtle Day**

Thursday 16<sup>th</sup> June was 'World Sea Turtle Day'. To celebrate, Sea Sense organised a community sports day in Juani Island, Mafia District, to raise awareness of the importance of conserving and protecting sea turtles and encourage commitment to conserving Tanzania's most important sea turtle nesting site. The celebration was formally opened by the Ward Representative for Jibondo. Football and netball matches were played out in front of crowds of spectators from the local community. The winning teams were presented with t-shirts and new sports equipment and hundreds of sea turtle posters were distributed amongst the community. Many villagers also took part in beach clean-ups on two of Mafia's most important sea turtle nesting beaches. The event was a huge success and celebrations carried on long after dark.



**Plates 19 & 20: Juani football team celebrate their win over Utende (left) and the ladies netball teams receive their prizes (right)**

### **3.7.3 Waste Management Education**

Awareness of the impacts of poor waste management on the marine environment is seriously lacking in many of the villages along the Tanzanian coast. There is also a lack of knowledge in communities about ways to reduce or dispose of waste. Waste management is not included in the school curriculum and many people remain ignorant of simple ways to manage different types of waste.

Mafia Island in particular suffers from poor waste management. Mafia Island has limited facilities to cope with waste disposal and because of ocean currents, litter from other areas around the world washes up on the shores of Mafia, adding to the waste generated by Mafia Island residents. In view of this, Sea Sense conducted a waste management education programme for three secondary schools in Mafia District: Kilindoni, Chemichem and Kitomondo schools. The objectives of the waste management education programme were:

- To raise awareness of waste issues in Mafia Island
- To provide education on ways to manage different types of waste
- To improve understanding of the impacts of waste on the marine environment

Four waste management sessions were delivered in each school, lasting one and a half hours each. 40 students attended the sessions in each school. The sessions focused on the following:

- The ecosystem concept and basic marine environmental biology
- Threats to the marine environment
- Pollution

The sessions consisted of lectures, group discussions and interactive games to help understanding of the concepts and encourage interaction.



**Plate 21: Students play the 'Web of Life' game**

There was a particular focus on plastic pollution which is one of the biggest pollution threats to the marine environment. The "4 R's" (Refuse. Reduce. Reuse. Recycle.) were introduced and students were asked to brainstorm ideas of how they could achieve each. The students were then given detailed drawings and descriptions of useful items that could be made out of discarded plastic bottles including hand washers, flytraps and rain gauges. Sea Sense asked the students to attempt to make one of the items at home to bring to class the following day.



During the third session Sea Sense asked each student to draw a picture of their perception of the marine environment and provided paper and art materials including water-colour paints, crayons and marker pens. A number of students also came to class with hand washers and flytraps that they had made at home. The entire class was dedicated to art and creativity focused on waste management. At the end of the day, Sea Sense held a competition for the best hand washer of the class and awarded a prize to the winner.

**Plate 22: A recycled hand washer is put to the test!**

Sea Sense also organised a number of beach clean-up days to raise awareness of the threat to nesting sea turtles and the health of the local community. Sea Sense recruited assistance from a variety of sources including Juani handicrafts group, school pupils from Mafia secondary schools, a local netball team and an environmental group. Beach clean-ups took place on several sea turtle nesting beaches in Juani, on public beaches in Utende village and at the harbour in Kilindoni.



***Plate 23: Students from Kitomondo Secondary School take part in a beach clean-up in Juani Island***

### **3.7.4 Theatre for Development**

Theatre for Development (TFD) is a participatory tool for creating learning opportunities and educational entertainment in rural communities. Members of the community are trained as TFD ‘artists’ and design a storyline based on an existing issue of concern within their community. The performance is specifically designed to pose questions and issues for discussion in order to have an exchange of ideas and experience. By involving local people in interactive play performances on a range of social issues (eg health, climate change, resource management), TFD builds a forum for creative, collective learning and empowers communities to develop solutions to a range of social, cultural and environmental issues.

With the help and guidance of staff from Bagamoyo College of Arts, Sea Sense organised two TFD events in Pangani District. Villagers in Choba and Sange villages were trained in TFD techniques including role playing and story-telling, to create a number of short plays to convey messages about the impact of human activities on the marine environment.

Following a week of training and rehearsals the performances took place in each of the villages and hundreds of villagers came to watch. The ‘artists’ acted out a series of short sketches including a piece involving two fishers who had accidentally captured a sea turtle in their net and were debating whether it should be released or slaughtered.



**Plate 24: TFD performers in Choba village, Pangani District**

The sketch provoked intense discussion about the right to eat sea turtles. Some felt strongly that sea turtles were an important source of protein while others argued that slaughtering sea turtles damaged the very ecosystem on which they depended for their livelihoods. After intense debate, the communities agreed that the turtle should be ‘released’. Theatre proved to be an effective tool to raise awareness and change attitudes towards conservation initiatives.

### **3.7.5 Fishers Marine Conservation Workshop**

Millions of people in Tanzania’s coastal zone rely on marine resources for their livelihoods yet have virtually no understanding of the impacts of human activities on the marine ecosystem and lack the necessary skills to manage marine resources sustainably.



**Plate 25: Fishers workshop, Pangani District**

To address this lack of capacity and understanding, Sea Sense organised an education and awareness workshop targeting local fishers in Pangani District together with a number of village leaders. The objective of the workshop was to equip fishers with essential knowledge and understanding of the link between conservation and livelihoods and the important role of endangered marine species in the wider marine ecosystem. The workshop consisted of presentations, group discussions, interactive games and a field trip to conduct a beach clean-up.

During the workshop it was clear that there was a widely held belief amongst the fishers that there were no economic benefits from conservation and none of the participants understood the link between conservation and livelihoods. Most believed that conservation activities could only be conducted by the Government of Tanzania and local communities had no role to play. Others believed that the community needed lots of money to be able to participate in conservation activities.

By the end of the workshop, many of these beliefs and perceptions had been dispelled and participants understood the importance of local community involvement in marine resource conservation.

### **3.7.6 DVD Shows**

Marine conservation films were shown in Kilwa Kivinje (Kilwa District), Kipumbwi and Stahabu (Pangani District) and Mbutu, Amani Gomvu, Kimbiji, Buyuni and Pemba Mnazi in Temeke District. Hundreds of people attended the film shows and there were lively discussions about marine conservation after the films had finished.



***Plate 26: Film shows in Temeke District***

In Kilwa Kivinje there were several groups of people at the shows who believed that Sea Sense represented the government and had been sent to insist on the establishment of BMU's in Kilwa. The groups were very aggressive and caused significant disruption to the film shows.

### **3.7.7 Mangrove Planting**

In March, Sea Sense organised a mangrove planting event in collaboration with Roots and Shoots group from IST Secondary School and Visikini Environmental Group. Eleven women from Visikini participated together with 16 students and three staff from IST. Sea Sense Conservation Officers from Visikini and Mbutu also participated.

The Sea Sense Education Officer gave a brief lecture about the biology and ecological role of mangroves. Mangrove saplings were then harvested from within the mangroves and replanted in an area which had been completely cleared of mangroves by the local community for building materials.

An area covering approximately 800m<sup>2</sup> was replanted with more than 7,000 saplings. The local group were extremely grateful for the participation of the students and requested another planting day later in the year.

### **3.7.8 Global Friends Programme**

Sea Sense partners with Born Free Foundation to deliver the Global Friends Programme, which aims to provide African schools with vital resources such as school desks and books and develop educational programmes that encourage children to learn about and take action for wildlife. Several primary schools in Mafia Island have benefited from the programme which has helped to build a link between conservation, education and communities.

In 2011, Bweni and Juani Primary Schools were the beneficiaries of the Global Friends Programme. Bweni Primary School requested text books covering History, Civics and Geography for Standard Six and Seven pupils. The Mafia District Education Officer and Ward Primary School Coordinator accompanied Sea Sense staff to Bweni to make the presentation to the teachers and pupils.

Juani Primary School requested resources that would enable them to develop music and sporting activities at their school. Sea Sense responded by delivering some musical instruments to establish a school band together with a football kit for the school football team. Staff from Mafia District Council and Mafia Island Marine Park joined in the presentation event.



***Plate 27: Juani Primary School pupils wait their turn to try out the new instruments***

### **3.7.9 Media and Magazine Releases**

In February 2011, a two page spread detailing the work of Sea Sense appeared in The Citizen newspaper.

In 2011 Sea Sense wrote a monthly article for the Dar es Salaam Yacht Club magazine. Articles covered topics including sea turtle biology, dugong conservation, ecotourism, environmental education and dynamite fishing.

### **3.7.10 Education and Awareness Presentations**

The Sea Sense team gave presentations on endangered marine species conservation to classes at the Elementary and Secondary International School of Tanganyika (IST) and Dar International Academy (DIA) in Dar es Salaam.

Sea Sense education sessions at IST had a significant impact. Many of the students chose marine conservation as their topic for their Primary Years Programme (PYP) final exhibition in May. The students created some inspiring exhibitions and raised TSh 386,000 for Sea Sense by selling cloth bags and collecting donations.

In September, Sea Sense visited the Help2Kids orphanage in Dar es Salaam as part of their 'Environment Week'. Sea Sense staff spent the day with the children playing environmental games, telling sea turtle stories and explaining how they could help to protect the marine environment.

### **3.7.11 DIA Community and Service Programme**

Dar International Academy runs a school volunteer programme whereby students volunteer on different projects in the wider community once every two weeks. A group of students at the school signed up to a 'Marine Conservation Programme' and conducted a beach clean-up, raised awareness of sea turtle ecotourism at local hotels and promoted the Sea Sense 'Adopt a Turtle Nest' programme. The students took part in a 'Junior Conservation Officer' day in March and learnt how to identify a turtle nest, translocate it safely and monitor it during the incubation period.

### **3.7.12 Dar es Salaam Charity Goat Races**

Sea Sense was present again at the 2011 Charity Goat Races in Dar es Salaam. The Sea Sense stand was full of information about endangered marine species and attracted hundreds of interested visitors. Sea Sense staff distributed a selection of awareness and education materials and encouraged visitors adopt a sea turtle nest. Sea Sense t-shirts were also for sale.

TSh 483,000 was raised at the 2011 Goat Races through sales of t-shirts, nest adoptions and posters.

### **3.7.13 Sea Sense Website**

In 2011, Sea Sense launched a new website which includes details of all Sea Sense projects together with interesting facts and figures about endangered marine species and their status in Tanzania.

[www.seasense.org](http://www.seasense.org)

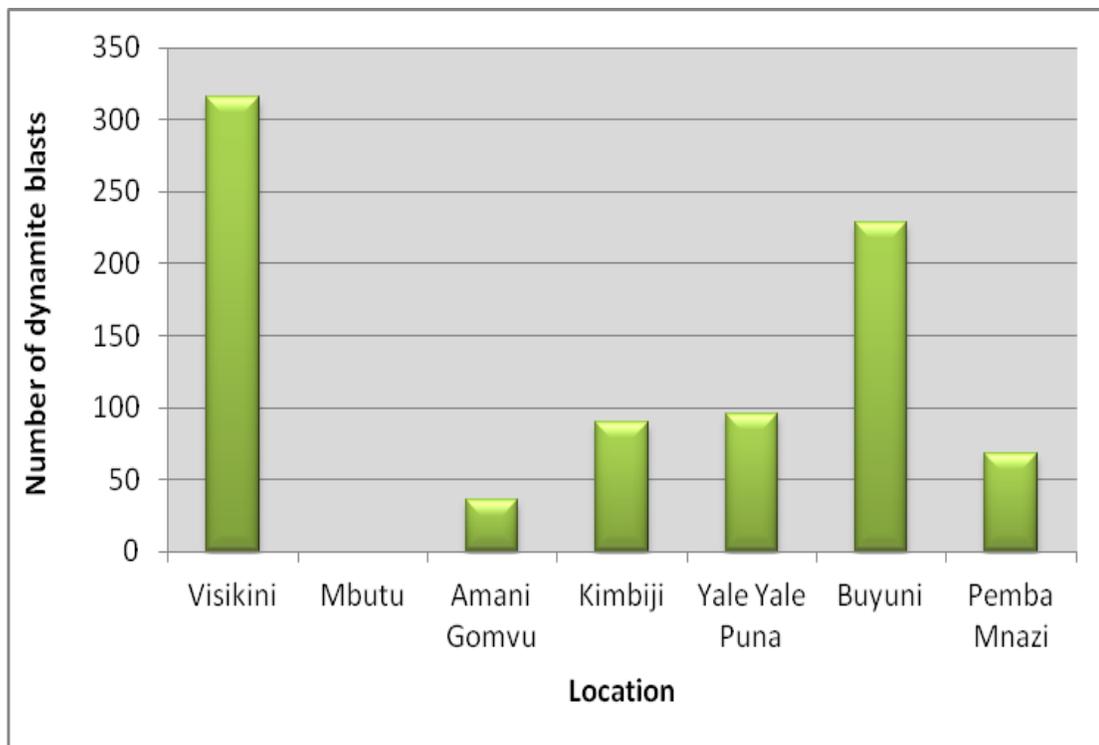
A Sea Sense Facebook page was also set up and provides weekly updates about the Sea Sense project and provides opportunities for other Facebook users to add their comments and photos

<http://www.facebook.com/pages/Sea-Sense/198707600182212>

### 3.8 Dynamite Fishing

Although illegal and highly dangerous, dynamite fishing continues unabated along much of the Tanzanian coast. Tanga, Temeke and Rufiji Districts are known dynamite fishing hotspots.

Data on date, time, location and number of blasts are collected by Sea Sense Conservation Officers. In 2011, Conservation Officers recorded 314 incidents of dynamite fishing with a total of 922 blasts. Figure 12 shows dynamite fishing data collected in Temeke District in 2011.



**Figure 12: Frequency of dynamite fishing reports in Temeke District, 2011**

The number of blasts recorded represented only a proportion of the true number of blasts. Some CO's have ceased to record blasts due to increasing frustration at the lack of government action to curb dynamite fishing. They also report an increasing lack of willingness amongst other community members to cooperate with reporting networks due to the lack of action.

In November, Sea Sense attended a meeting called by MACEMP to discuss strategies to address dynamite fishing. The meeting was attended by representatives from the World Bank, Attorney General's Office, Fisheries Division, Zanzibar Fisheries Department, WWF and TIPFA. Proposed actions included:

- Production of status report including economic analysis and potentially exposing individuals and entities involved in marketing and supply of dynamite
- Improving transparency and accountability in judicial process
- Translation of Fisheries Regulations to Kiswahili
- Enforcement operation at key hotspots
- Close loopholes in terminology of Fisheries Act, 2003 and Regulations, 2008 regarding penalties for dynamite fishing

Sea Sense will be involved in the production of the status report.

### **3.9 Scientific Symposia, Workshops and Meetings**

#### **3.9.1 31<sup>st</sup> International Sea Turtle Symposium**

In April, the Sea Sense Coordinator gave an oral and poster presentation at the 31st International Sea Turtle Symposium in San Diego, USA. An oral presentation was given on sea turtle monitoring in Mafia Island and a poster presentation given on sea turtle conservation efforts in Maziwe Island, Pangani District.

The symposium is held each year and is an international gathering of 800-1000 of the world's foremost sea turtle scientists, conservationists, policy-makers and enthusiasts from more than 70 countries, and the only major conference of its type. The symposium was a valuable opportunity to publicise the progress being made in sea turtle conservation in Tanzania and network with colleagues from the region to discuss progress relating to the implementation of the Indian Ocean South East Asia (IOSEA) Marine Turtle Memorandum of Understanding of which Tanzania is a signatory state.

#### **3.9.2 Western Indian Ocean Marine Science Association (WIOMSA) Symposium**

Sea Sense attended the 7<sup>th</sup> WIOMSA Symposium in Mombasa in October and gave an oral presentation on the impacts of dynamite fishing and a poster presentation on 10 years of sea turtle monitoring in Mafia Island.

#### **3.9.3 Tanzania Turtle & Dugong Conservation Committee (TTDCC)**

To facilitate the implementation of the sea turtle and dugong MoU's in Tanzania, a national committee has been established comprising a number of institutions that have an interest in endangered marine species conservation. Representative institutions include:

- Fisheries Development Division (Chair & Secretary)
- Marine Parks & Reserves Unit (Treasurer)
- University of Dar es Salaam
- Tanzania Fisheries Research Institute
- Vice Presidents Office – Division of Environment

- Sea Sense (Co-chair)
- WWF

The overall objective of the Committee is to coordinate all national initiatives related to conservation and management of dugongs and sea turtles. A full committee meeting was held in February 2011 and several smaller meetings were held to discuss implementation of the dugong bycatch survey.

## **4. Funding**

### **4.1 RECOMAP**

In May 11, Sea Sense completed all project activities funded by Recomap Call for Proposals 2. Funds were used to develop sea turtle ecotourism in Mafia and Temeke Districts over an 18 month period.

### **4.2 WWF**

In July 2011, Sea Sense entered into the second year of a three year funding period. Funding from WWF supports endangered marine species work in Mafia, Rufiji and Kilwa Districts. Sea turtle work is focusing specifically on the development of sea turtle ecotourism in Mafia District. In Rufiji and Kilwa Districts dugong conservation activities are being implemented through the Collaborative Fisheries Management Area process.

### **4.3 USAID**

2011 saw the completion of the second year of funding from USAID to support sea turtle work in Pangani District which will continue until 2013. During year two of the project, Sea Sense monitored and protected sea turtle nests at six nesting beaches and conducted several training and education events including a teacher training workshop and a Theatre for Development project.

### **4.4 Born Free Foundation (BFF)**

During 2011, BFF provided essential funds to cover project overheads including staff salaries, office rent, insurance and annual audit costs.

### **4.5 Dar es Salaam Charity Goat Races**

In 2011 Sea Sense was awarded a grant of TSh 9,464,000 from the Dar es Salaam Charity Goat Races. The funds are being used to support a marine conservation education programme in five secondary schools in Temeke District.

### **4.6 Flora and Fauna International**

In September, Sea Sense was awarded a grant of GBP 6,366 by the FFI Flagship Species Fund. The funds will be used to support endangered marine species awareness workshops for five Beach Management Units in Temeke District.

### **4.7 Corporate Donations**

A total of USD 13,000 was raised through corporate donations from Dominion Oil and Gas and Resolute Tanzania. The funds are being used to support endangered marine species work in Temeke District.

## **5. Problems Encountered**

### **5.1 Continuation of Illegal Activities**

Despite clear evidence and information provided by Sea Sense to national, district and village personnel, illegal activities including sea turtle slaughter, nest poaching, dynamite fishing, live coral mining and mangrove cutting continue.

Following frequent reports of illegal activities taking place in and around Kilwa, Sea Sense conducted a patrol at Kilwa Mtoni and Kilwa Masoko to assess the true extent of illegal activities including coral mining, dynamite fishing and mangrove harvesting.

During the patrol at Kilwa Masoko several fishers who knew Sea Sense volunteered information about the extent of sea turtle slaughter. A large number of discarded carapaces were observed on the beach and hidden in nearby vegetation. Several lime processing sites were also identified at Kilwa Mtoni.



***Plate 28: Lime processing site at Kilwa Mtoni***

At Kilwa Masoko, large areas of mangrove forest had been cleared. The Conservation Officer from Kilwa reported that the mangroves had been cleared by fishers looking for bait. Photographs were taken and the issue reported to the RUMAKI office in Kilwa.



**Plate 29: Extensive mangrove clearance at Kilwa Masoko**

Sea turtle slaughter was also reported to be commonplace at Kilwa Kivinje and Kilwa Kisiwani. The Sea Sense Conservation Officer in Kilwa Kivinje recently apprehended a fisher selling turtle meat and reported him to the village office where the case is currently being dealt with.

### **5.2 Limited Enforcement & Awareness**

Despite clear conservation measures in Tanzanian legislation to protect endangered marine species, there is very limited enforcement by relevant government authorities. Offenders who deliberately hunt or poach turtle eggs, or who use destructive and illegal fishing practices such as dynamiting, are rarely issued with appropriate penalties in accordance with the law.

Limited awareness of the laws is also a major challenge. In 2010 Sea Sense made considerable effort to raise awareness of the revised 2009 Fisheries Regulations that have improved the level of protection for endangered marine species. Most coastal communities had no knowledge of the regulations. The new regulations are currently being translated into Kiswahili and upon completion, Sea Sense intends to produce awareness materials for distribution in coastal communities.

### **5.3 Poor Waste Management**

In addition to the challenges related to the disposal of plastic waste, Sea Sense identified other waste management issues in Mafia that have serious implications for the health of the local community. Firstly, the area used by fishers at the harbour in Kilindoni to dry their fish was extremely dirty and was a breeding ground for flies and other crawling insects which are known to carry infectious diseases.



***Plate 30: Proliferation of maggots near to Kilindoni harbour, Mafia District***

Sea Sense took several photos of the area and took them to the DMEO and DED office as evidence. Sea Sense stressed that urgent action was needed to prevent a serious health issue developing. The District Fisheries Officer was asked to speak with the fishers to insist on improved waste management practices.



Secondly, as part of the waste management education programme, Sea Sense visited several seasonal fisher camps on the islands of Shungimbili, Nyororoa and Mbarakumi on the west coast of Mafia Island, all of which are designated as Marine Reserves. Despite their Reserve status, there were large, well established fisher camps, particularly on Nyororo which supported an estimated fisher population of 250. The area around the camps was full of discarded plastic bags, water bottles and juice boxes which will ultimately end up in the ocean and pose a significant risk to sea turtles and other marine species.

***Plate 31: Plastic waste at migrant fisher camp in Nyororo Island***

There were also several sea turtle carapaces amongst the rubbish, indicating that the fishers were slaughtering sea turtles for consumption.

Sea Sense spoke with several groups of fishers and it was clear that most of them were not local to Mafia but were migrant fishers from Mtwara, Rufiji, Tanga and Dar es Salaam. Many confessed to using unregistered boats and illegal fishing gears. However, they had little fear of apprehension due to lack of Fisheries Division or Marine Park patrols in the area and alleged corruption amongst officials who accepted bribes to allow illegal fishing. Sea Sense provided information to the fishers on endangered marine species, the 2009 Fisheries Regulations and the impacts of poor waste management.

Sea Sense reported the presence of the migrant fisher camps and the destruction of the island environment to the District Commissioner, Mafia Island Marine Park staff and the District Fisheries Office. The District Commissioner called a meeting with representatives from each department. Sea Sense was able to give detailed feedback about the fisher camps, their use of unregistered boats and illegal fishing gears, poor enforcement by the Fisheries Office, the unsanitary conditions on the island and suspected slaughter of sea turtles. Sea Sense provided photographic evidence to show the state of the islands. Upon seeing the evidence, the District Commissioner asked the Fisheries Department to write a report on what had been discussed and explain why they had failed to address waste management and illegal fishing issues within the reserves.

Sea Sense has since made a follow up but it was unclear if the report had been written or not. Sea Sense will continue to raise awareness amongst District staff of the need to take action against illegal exploitation of marine resources.

## **6. Aims for 2012**

- Continue endangered marine species conservation activities in six coastal districts in Tanzania
- Conduct sea turtle flipper tagging programme in Juani Island, Mafia District
- Satellite tag four nesting sea turtles in Mafia District
- Satellite tag three nesting sea turtles in Temeke District
- Submit dugong tissue samples to James Cook University, Australia, for analysis
- Recruit a Turtle Tour Guide in Ushongo village, Pangani District
- Produce a sea turtle ecotourism brochure for Mafia Island
- Conduct Theatre for Development project in two villages in Pangani District
- Conduct dugong awareness workshops for CFMA members in Mafia District
- Conduct education and awareness programme at nine secondary schools in Mafia and Temeke Districts
- Provide endangered marine species education to five Beach Management Units in Temeke District

- Hold a 'World Environment Day' celebration in Mafia District
- Hold a 'World Sea Turtle Day' celebration in Mafia District
- Conduct endangered marine species bycatch awareness sessions in Mafia and Pangani Districts
- Conduct a sea turtle conservation workshop for 15 SANAPA wardens
- Provide training to sea turtle monitors in Mnemba Island Lodge, Zanzibar
- Promote Sea Sense turtle adoption programme
- Attend inaugural Western Indian Ocean Environmental Educators Network workshop (REEFS) in Mauritius
- Attend 32<sup>nd</sup> International Sea Turtle Symposium in Mexico
- Conduct a fundraising campaign
- Conduct a media campaign to promote the work of Sea Sense

## **7. Immediate & Long Term Benefits**

The immediate benefits from Sea Sense activities are:

- Protection of nesting sea turtles and their eggs from both human and non-human predators
- Protection of dugongs through the CFMA process and the implementation of the Dugong MoU
- Improved understanding of sea turtle biology through research programmes (tagging, DNA sampling)
- Enhanced capacity amongst local communities, government personnel and UDSM students through training and field work in marine conservation and sustainable resource use
- Improved local livelihoods through employment of community members (Conservation Officers & Tour Guides)
- Improved knowledge and awareness of the status, distribution and threats to marine species and habitats in Tanzania

Long-term benefits include:

- Development of ecotourism and generation of revenue through sea turtle adoptions and handicrafts production
- Improved understanding of marine conservation and sustainable resource use at community level leading to wise use of resources in the future
- Improved population status of endangered sea turtles and other marine species in Tanzania
- Implementation of international sea turtle and dugong MoU's
- Improved knowledge amongst the scientific community of sea turtle conservation in Tanzania

- Improved reputation of Tanzania in relation to endangered marine species conservation

## **8. Acknowledgements**

Sea Sense would like to thank their donors, particularly Born Free Foundation, WWF, USAID and the EU RECOMAP programme for their continued funding and support. Thanks also to Dar es Salaam Charity Goat Races, Resolute (Tanzania) Ltd, Dominion Tanzania Ltd and Authentic Tanzania for supporting Sea Sense work. Finally, our thanks to all Conservation Officers, Village Chairpersons, Council members and Environment Committees for helping to protect endangered marine life in Tanzania.

**Appendix I: Results of Activities Implemented by Sea Sense in 2011**

Activities	Results / Achievements	Remarks
1. Flagship species data collection	<ul style="list-style-type: none"> <li>• Number of turtle nests recorded: 379</li> <li>• Eight turtles tagged in Mafia Island</li> <li>• Number of live dugong sightings: 11</li> <li>• Many humpback whales sighted off the Tanzanian coast between July and December</li> </ul>	<ul style="list-style-type: none"> <li>• 375 nests were laid by green turtles (<i>Chelonia mydas</i>), peaking in April</li> <li>• Four were laid by hawksbill turtles</li> <li>• Dugong sightings in Mafia and Rufiji Districts</li> </ul>
2. Sea turtle nest monitoring and protection	<ul style="list-style-type: none"> <li>• Number of nests hatched successfully: 360</li> <li>• Number of hatchlings: 33,453 (success rate: 74% for greens and 80% for hawksbills)</li> <li>• Number of nests predated / partially predated: 16</li> <li>• Number of nests poached: 3</li> <li>• Number of nests inundated: 8</li> <li>• Number of nests rotted: 8</li> </ul>	<p>Nests were predated by red ants and monitor lizards. Efforts were made to protect nests from predation through translocation and netting.</p>
3. Mortality analysis for flagship species	<ul style="list-style-type: none"> <li>• Number of sea turtle mortalities recorded: 166</li> <li>• Average CCL was 62.3 cm (SD±23)</li> <li>• Cases of fibropapilloma in stranded specimens: 1</li> <li>• Number of dead dugongs reported: 0</li> <li>• Number of dead cetaceans recorded: 7</li> </ul>	<ul style="list-style-type: none"> <li>• 156 were green turtles, eight were hawksbill, one was an olive ridley and one was unidentified</li> </ul>
4. Sea Turtle Ecotourism	<ul style="list-style-type: none"> <li>• Sea turtle ecotourism opportunities in</li> </ul>	

	<p>Mafia, Temeke &amp; Pangani Districts</p> <ul style="list-style-type: none"> <li>• Four Turtle Tour Guides leading guests in Mafia and Temeke Districts</li> <li>• Four access routes to nesting beaches cleared in Juani Island</li> <li>• Beach shelter constructed at Kishiko Kikubwa beach</li> <li>• \$2,830 raised in Mafia District</li> <li>• \$2,698 raised in Temeke District (including \$1,350 raised through partnership with safari operator in DSM)</li> <li>• Revenue from sea turtle ecotourism donated to Village Environment Funds in four villages</li> <li>• 51 sea turtle nests adopted, raising \$2,550</li> <li>• \$1,615 raised through Sea Sense t-shirt sales</li> <li>• 'Guidelines for Development of Sea Turtle Ecotourism in Tanzania' produced</li> <li>• Sea turtle ecotourism promoted on <a href="http://www.mydestination.com/Tanzania">www.mydestination.com/Tanzania</a></li> <li>• Sea turtle ecotourism workshop held with tourism operators</li> </ul>	
<p>5. Surveys</p>	<ul style="list-style-type: none"> <li>• Endangered marine species bycatch survey conducted in Mkinga and Mtwara Districts</li> <li>• Dugong boat survey conducted in Mafia Island</li> </ul>	<p>Surveys revealed</p> <ul style="list-style-type: none"> <li>- Dugongs rarely seen at either location</li> <li>- Sea turtle consumption commonplace</li> </ul>

		<ul style="list-style-type: none"> <li>- Dolphins frequently observed at both locations</li> </ul>
<p>6. Training</p>	<ul style="list-style-type: none"> <li>• Statistics and Monitoring &amp; Surveillance committees of two CFMA's trained in dugong conservation in Rufiji and Kilwa Districts</li> <li>• 10 villages leaders in Buyuni village , Temeke District trained in participatory video techniques</li> <li>• 32 primary school teachers trained in environmental education programmes</li> <li>• 10 staff in Fanjove Island, Kilwa District trained in sea turtle biology and conservation</li> <li>• 29 staff from three tourist lodges trained in sea turtle biology and conservation</li> <li>• 10 fishers in Sange village, Pangani District trained in safe release of sea turtles from fishing nets</li> <li>• 17 staff and community members in MBREMP trained in sea turtle biology and conservation</li> <li>• Two students from the University of Dar es Salaam trained in office administration and practical field conservation methods</li> <li>• 40 women trained in handicrafts production in Mafia District</li> </ul>	<ul style="list-style-type: none"> <li>• CFMA training included: dugong biology &amp; life history, global status, threats to survival</li> </ul>

<p>7. Education and Awareness</p>	<ul style="list-style-type: none"> <li>• World Environment Day celebrated in Mafia District</li> <li>• World Sea Turtle Day event held in Mafia District</li> <li>• Waste management education campaign at three secondary schools in Mafia District</li> <li>• Theatre for Development performances held in two villages in Pangani District</li> <li>• Marine conservation workshop for fishers held in Pangani District</li> <li>• Marine conservation films shown in Kilwa, Temeke and Pangani Districts</li> <li>• Mangrove planting day held in Temeke District</li> <li>• School equipment delivered to two primary schools in Mafia District as part of the Global Friends Programme</li> <li>• Presentations held at two international schools in DSM</li> <li>• Village meetings held in six coastal Districts</li> <li>• Beach clean-up events held in Mafia District</li> <li>• 13 magazine articles and press releases published</li> <li>• Sea Sense stand at Dar es Salaam Charity Goat Races</li> </ul>	<ul style="list-style-type: none"> <li>• Several hundred people attended WED and WSTD events</li> <li>• TFD valuable tool to stimulate discussions on marine resource use</li> </ul>
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	<ul style="list-style-type: none"> <li>• Community &amp; Service programme implemented with DIA students</li> <li>• New website and Facebook page launched</li> </ul>	
8. Dynamite Fishing	<ul style="list-style-type: none"> <li>• Blasts recorded by CO's in Temeke, Rufiji and Kilwa District</li> <li>• Sea Sense attended MACEMP meeting to discuss national level anti-dynamite fishing strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Despite many anti-dynamiting initiatives, the practice persists along much of the Tanzanian coast</li> <li>• Village leaders agree that dynamite fishing is the most threatening fishing practice in Temeke District. Main reason given for the persistence of dynamite fishing is limited or lack of law enforcement. Many villagers complain that fishers caught with dynamite or dynamited fish are released after a few days, contrary to Fisheries laws.</li> <li>• Many CO's refused to collect dynamite fishing data due to lack of action from authorities</li> </ul>
9. National, Regional and International Workshops and Meetings	<ul style="list-style-type: none"> <li>• Oral and poster presentations given at 31<sup>st</sup> International Sea Turtle Symposium</li> <li>• Two papers presented at 7<sup>th</sup> WIOMSA Symposium</li> <li>• One meeting of the Tanzania Turtle and Dugong Conservation Committee held</li> </ul>	