



**COMMUNITY BASED
CONSERVATION OF
THREATENED MARINE SPECIES
AND HABITATS
IN TANZANIA**



Helping coastal communities protect endangered marine life in Tanzania

ANNUAL REPORT 2012



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EXECUTIVE SUMMARY

Between January and December 2012, 382 green turtle nests were recorded by Sea Sense. 305 nests hatched successfully enabling 29,757 sea turtle hatchlings to safely reach the sea. Peak nesting activity was recorded in June. A saturation flipper tagging programme was conducted on four nesting beaches in Juani Island in April and May to collect data on population size, clutch frequencies, duration of inter-nesting intervals and levels of nest site fidelity. Seven satellite tags were deployed on nesting green turtles to identify post nesting migratory routes and the location of important foraging grounds. 13 flipper tags were recovered from sea turtles tagged elsewhere in the region. Sea turtle ecotourism activities generated revenue in Mafia, Temeke and Pangani Districts. 252 stranded turtles were recorded along the coast, either slaughtered or caught in nets. Lindi Region was identified as a high risk area for sea turtles due to the existence of a targeted sea turtle fishery and high levels of direct take. Two live dugongs were sighted by local fishers in Mafia District and one dugong was reported to be captured in a gill net and slaughtered for consumption. Sea Sense Conservation Officers recorded two dead cetaceans. Sea Sense conducted a survey on the marine curio trade in Tanzania which contributed to an analysis of the trade in the wider Western Indian Ocean region. Education and awareness programmes using theatre, art and song focused on sea turtle slaughter, bycatch reduction and impacts of illegal fishing and poor waste management. Community events were held to celebrate World Environment Day, World Sea Turtle Day and World Fisheries Day. Capacity building and training workshops were held for village leaders, Beach Management Unit and Collaborative Fisheries Management Area committees, SANAPA Rangers and tourism stakeholders. Presentations were given at the 32nd International Sea Turtle Symposium and the 4th meeting of the Western Indian Ocean Marine Turtle Task Force. Sea turtle slaughter, live coral mining, mangrove harvesting and dynamite fishing continue to be practiced despite efforts to curb them.

1. INTRODUCTION

Tanzania is home to an outstanding array of marine habitats including coral reefs and seagrass beds that are important feeding grounds for several threatened marine species including five species of sea turtle; green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*) loggerhead (*Caretta caretta*), olive ridley (*Lepidochelys olivacea*) and leatherback (*Dermochelys coriacea*), dugongs (*Dugong dugon*), whale sharks (*Rhincodon typus*) and several species of whale and dolphin. Green and hawksbill turtles also nest on many of Tanzania's sandy beaches.

These marine habitats are also central to the lives of coastal fishing communities, providing income and food security for millions of people. Due to a growing human population in the coastal zone, sea turtles, dugongs, whale sharks and their habitats are under increasing pressure. Sea turtles and dugongs are frequently entangled in fishing nets and deliberately slaughtered for their meat. Unregulated coastal development is causing the loss of important sea turtle nesting beaches and foraging habitats are being degraded by illegal and destructive fishing practices.

Over the past twelve years, Sea Sense has targeted the conservation of flagship species such as sea turtles, dugongs and whale sharks to achieve broader marine conservation goals. In view of the fundamental link between humans and their environment, Sea Sense uses a 'grassroots' approach to marine conservation and is the only project of its kind in Tanzania. Sea Sense engages coastal communities in a range of marine conservation initiatives and provides education and training programmes in marine resource management. Each of the programmes is specifically designed to deliver conservation benefits for threatened marine species and socio-economic benefits for coastal communities. This report highlights Sea Sense activities in 2012.

2. AIMS AND OBJECTIVES

The overall goal of Sea Sense is to conserve marine biodiversity by engaging coastal communities in initiatives that promote sustainable use and management of coastal and marine resources.

The specific objectives are to:

- Improve the conservation status of threatened marine species and habitats
- Increase knowledge and understanding of coastal and marine ecosystems
- Strengthen multi-level national capacity to use and manage coastal and marine resources wisely
- Strengthen local and national governance of coastal and marine resources

- Improve coastal livelihoods through support for sustainable revenue generating activities
- Collect, publish and disseminate project results to national, regional and international stakeholders

3. IMPLEMENTATION AND RESULTS

OBJECTIVE 1: IMPROVE THE CONSERVATION STATUS OF THREATENED MARINE SPECIES AND HABITATS

SEA TURTLE NEST MONITORING AND PROTECTION

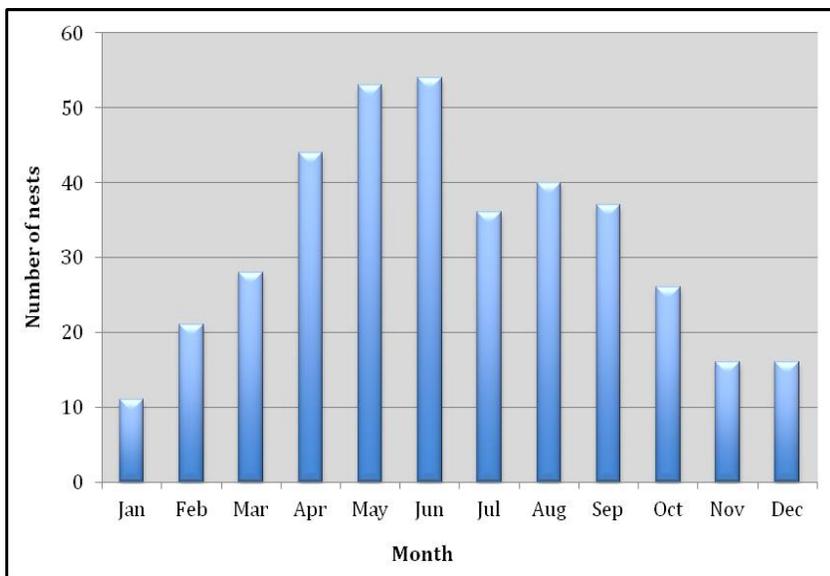
A network of 34 community Conservation Officers, recruited and trained by Sea Sense, conducted early morning foot patrols on a daily basis at known sea turtle nesting beaches, spread over six coastal districts. The number and species of nesting turtles were recorded based on track counts. Any nest under threat from poaching, predation or tidal inundation was relocated to a safer area above the spring high water mark. All other nests were left to incubate *in situ*.



Nests were monitored until hatching and then excavated to determine clutch size and hatching success. During 2012 the following results were obtained:

- 382 green turtle (*Chelonia mydas*) nests were recorded
- Almost half (43%) were laid in Mafia Island (n=163)
- Nests also recorded in Temeke (n=120) and Pangani (n=98) Districts
- Disturbance from migrant fisher camps and port traffic reduced likelihood of nesting in Kilwa District
- Poachers destroyed two nests in Ras Dima, Rufiji District
- 305 nests hatched successfully (7 of which were laid in 2011)
- 29,757 hatchlings emerged and reached the sea
- Hatching success was 77%
- 23 nests were still incubating at the end of 2012

- 61 nests failed to hatch
- 14 nests predated by monitor lizards (*Varanus spp*)
- 13 nests predated by red ants (*Solenopsis spp*)
- 12 nests predated by mongoose (*Herpestes spp*)
- Nests at high risk of predation were relocated to a safer area and covered with a net
- 15 nests rotted
- Two nests were poached (both in Temeke District)



Green turtles nest on Tanzania's beaches all year round although there is usually a noticeable peak in nesting activity between April and May each year. However, in 2012, peak nesting activity was recorded slightly later in June when 54 nests were recorded. Figure 1 shows the seasonality of green turtle nesting in 2012 (data taken from all sites monitored by Sea Sense).

Figure 1: Seasonality of green turtle nesting in Tanzania, 2012

Since 2001, 3,432 nests have been recorded and monitored by Sea Sense and 253,993 hatchlings have safely reached the sea.

NEST INCENTIVE SCHEME

Sea Sense operates a nest incentive scheme whereby small financial incentives are given to villagers who report sea turtle nests to Conservation Officers. Incentives consist of an initial 'founder' incentive and additional incentives for every egg that hatches successfully. 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 2012, a total of TSh 5,069,950 (USD 3,200) was paid to local communities through the nest incentive scheme.

FLIPPER TAGGING

A saturation flipper tagging programme was conducted on four nesting beaches in Juani Island, Mafia District, which is the most important green turtle rookery in Tanzania. Night time patrols were conducted during the peak nesting months of April and May. Each female encountered was measured (curved carapace length and width) and examined for the presence of existing tags. If not already tagged, individually numbered titanium tags (TZ series) were applied between the first and second scale along the posterior edges of the front flippers. Tagging was done after oviposition was complete to minimise disturbance. Analysis of the data provided information on inter-nesting intervals, clutch frequencies and levels of nest site fidelity.



Applying a flipper tag

- 60 emergences were recorded
- Nesting success rate was 83%
- 18 individual females nested during the survey period
- Females were encountered during 46 (92%) of the nesting events.
- Observed clutch frequency (OCF) was 2.5 ± 1.2
- 14 nests (28%) were relocated and had a mean clutch size of 131 ± 16
- Nine individuals nested at least three times and five used the same beach for each clutch
- Inter-nesting intervals ranged from 9 to 20 days (n=31) with a mean of 13.2 ± 2.3 days.

FLIPPER TAG RECOVERIES

13 flipper tags were recovered from stranded turtles and returned to Sea Sense. 12 of the tags originated from elsewhere in the Western Indian Ocean region (Seychelles, Comoros, Mozambique, Mayotte and Kenya). Two of the individuals were found stranded on the beach by Conservation Officers while the remaining 10 were captured in fishing nets and deliberately slaughtered for meat.

The tag recoveries confirm that the Tanzanian coast is an important foraging site and migratory corridor for green turtles that nest elsewhere in the region. Although accurate poaching data is hard to access, it could be a major source of mortality for green turtles in the region.

SATELLITE TRACKING

In 2012, Sea Sense undertook the first sea turtle satellite telemetry project in Tanzania to identify post nesting migratory routes and determine the location of important foraging grounds within Tanzania and the wider region.

Telonics tags were deployed on three nesting green turtles in Temeke District between March and July as part of the South Western Indian Ocean Fisheries Project (www.swiofp.net).



Satellite tagged turtle (Rosie) returns to the sea in Temeke District

- Tag durations ranged from 24 days to 36 days
- All three tagged turtles remained in Tanzania.
- Two of the turtles went on to lay further nests after tagging generating data on behaviour during inter-nesting intervals
- Both utilized a reef known as Sukuti in Mkuranga District
- One turtle migrated north to a foraging ground in Pemba Island (Figure 2)



Figure 2: Satellite tracks of migrating turtle, Rosie, August 2012

Wildlife Computers SPOT 5 tags were deployed on four nesting green turtles in Juani Island, Mafia District in June. Tag duration ranged from 69 days to 248 days. Two of the turtles migrated to foraging grounds within Tanzania whilst two migrated beyond Tanzanian waters into Kenya and Somalia (Figures 3 and 4). The longest migration was 3,200km from the nesting beach in Mafia to northern Somalia. Both turtles that travelled north took the same route, travelling along the east coast of Zanzibar and then turning northwest to pass through the Pemba Channel. It is likely that they were taking advantage of coastal currents to expend less energy reaching their foraging grounds.

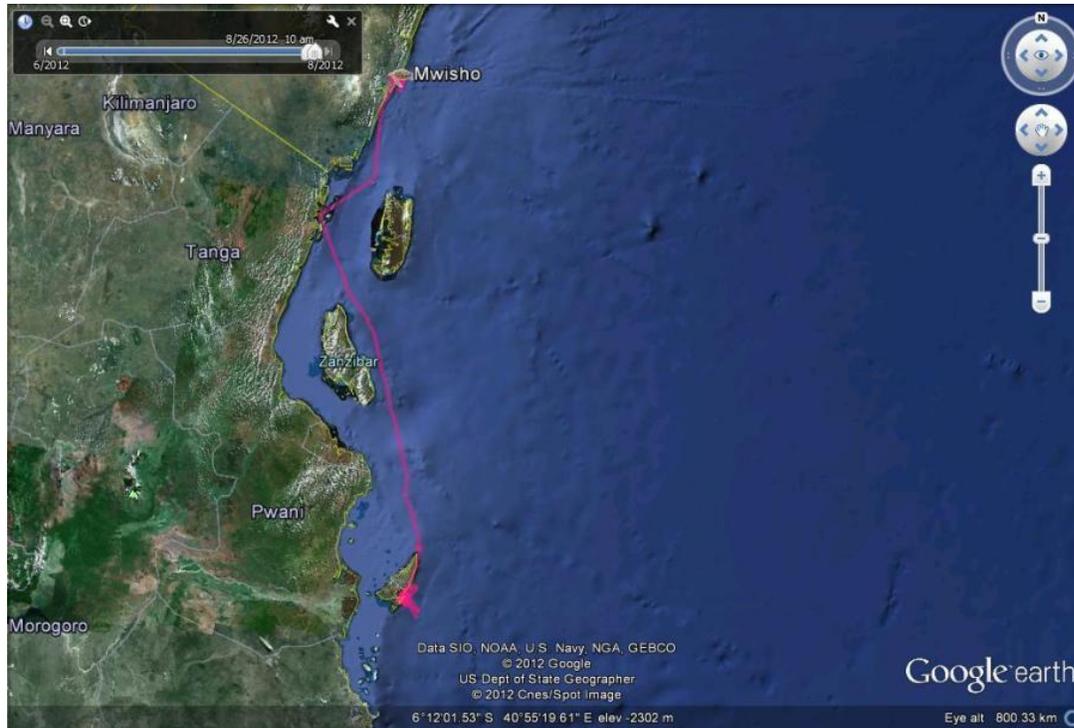


Figure 3: Movement pattern of green turtle 113988 (Mwisho)

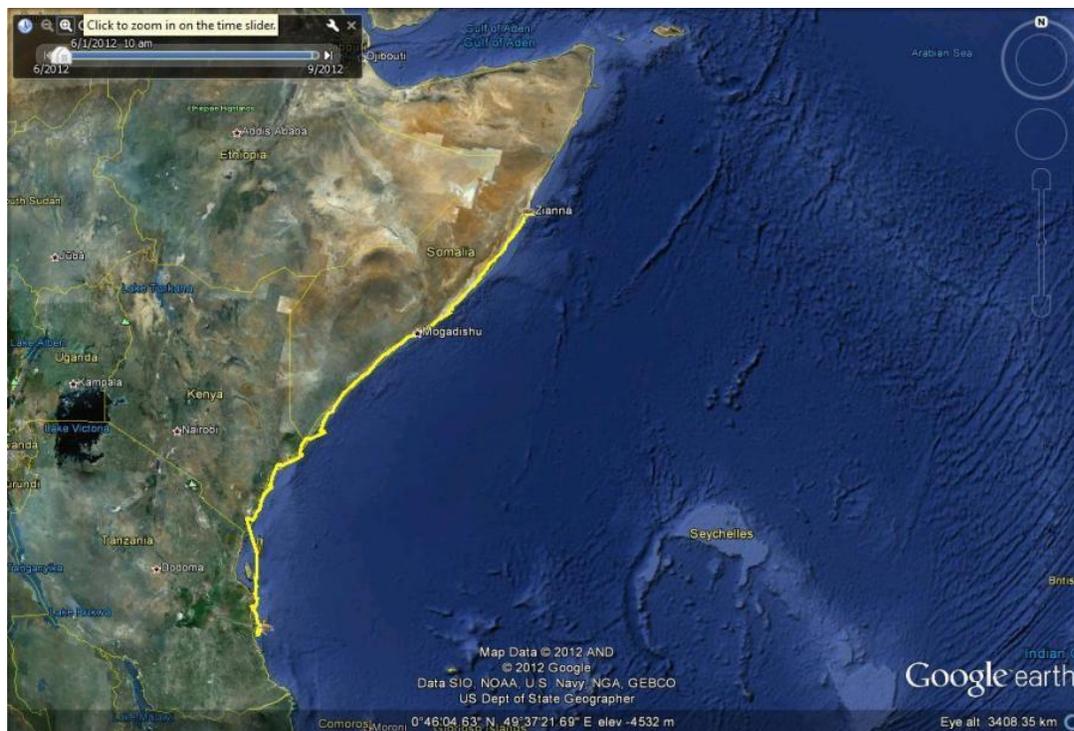


Figure 4: Movement pattern of green turtle 113986 (Zianna)

SEA TURTLE MORTALITIES

Sea turtle stranding data were collected by Conservation Officers while conducting daily foot patrols. Stranding data were used to identify areas of high risk to sea turtles from fisheries interactions and deliberate take. Stranding data also enabled Sea Sense to ensure that education and awareness programmes targeted those communities who participated in activities posing a risk to sea turtles.

252 sea turtle strandings were recorded in 2012 (Table 1).

Location	Green	Hawksbill	Olive ridley	Logger head	Leather back	Total
Temeke	94	4	1	0	0	99
Mkuranga	12	0	0	0	0	12
Rufiji	57	9	0	0	1	67
Kilwa	20	0	0	0	0	20
Mafia	3	0	0	0	0	3
Pangani	44	2	3	0	0	49
Dar es Salaam	0	0	1	0	0	1
Zanzibar	0	0	0	1	0	1
Total	230	15	5	1	1	252

Table 1: Sea turtle mortality data, 2012

Sea turtles are known to strand in the vicinity of migratory routes, foraging grounds, developmental habitats and nesting beaches. The high frequency of strandings in Temeke District may be due to the fact that Temeke District supports a nesting population and is a migratory corridor for adult green turtles moving to foraging grounds in the north of the region. Furthermore, the average curved carapace length (CCL) of stranded green turtles in Temeke District was 63 cm (SD±18 cm), which is well below that of mature green turtles (>95cm) suggesting that the area also provides foraging grounds for juvenile green turtles.

There are high levels of fishing pressure in Temeke District resulting from its close proximity to Dar es Salaam, the commercial capital of Tanzania with a population of more than five million people. Hence, fisheries interactions are likely to be a major source of mortality in Temeke District for all five species of sea turtle found in Tanzanian waters.



Olive Ridley turtle stranding, Dar es Salaam

- Direct take of sea turtles is commonplace in many coastal communities in Tanzania
- Sea turtle butchery sites observed in Kipumbwi (Pangani District), Buyuni and Yale Yale Puna (Temeke District), Kifinge (Mafia District) and Mnago (Kilwa District)
- Migrant fishers frequently involved in direct take of sea turtles
- Sea turtle meat is sold to dealers who supply local markets
- Sea turtle meat is used as an ingredient in soup



Evidence of sea turtle slaughter, Temeke District

SEA TURTLE SURVEY IN LINDI REGION

Sea Sense, in collaboration with Fisheries Development Division (Ministry of Livestock and Fisheries Development) conducted a survey to determine the status of sea turtles in Lindi District. Local beaches were surveyed on foot and 117 questionnaire interviews were conducted in six fishing communities.

The information gathered, which was common to all six villages, identified the following:

- Fishers catch sea turtles accidentally and intentionally and trade in meat and shells
- Hand-made gill nets (made in Mtwara) and gill nets from local gear suppliers are used to intentionally catch sea turtles
- Consumption of hawksbill meat resulted in multiple cases of human poisoning and death in the 1980/90's
- A lack of awareness exists concerning poisonous sea turtle meat
- The abundance of sea turtles has decreased since 2000 due to increased sea turtle consumption for food and trade and weak enforcement of Fisheries Legislation that prohibits consumption and trade in sea turtle products
- Reluctance to admit consumption of sea turtle meat for fear of apprehension by law enforcers as fishers were aware of Fisheries Regulation prohibiting intentional capture and killing of sea turtles
- Green turtles are exploited for food (meat and eggs) more commonly than other sea turtle species
- Sea Sense observed dynamite fishing, unregistered and unlicensed fishing vessels and the frequent use of beach seine nets

Rampant dynamite fishing in Lindi District and the lack of enforcement of fisheries laws is likely to hinder efforts to combat other illegal activities, including the intentional capture and slaughter of sea turtles.

DUGONG MONITORING NETWORK

In 2004, Sea Sense established a community based 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.



Figure 5: Live Dugong Sightings, 2012

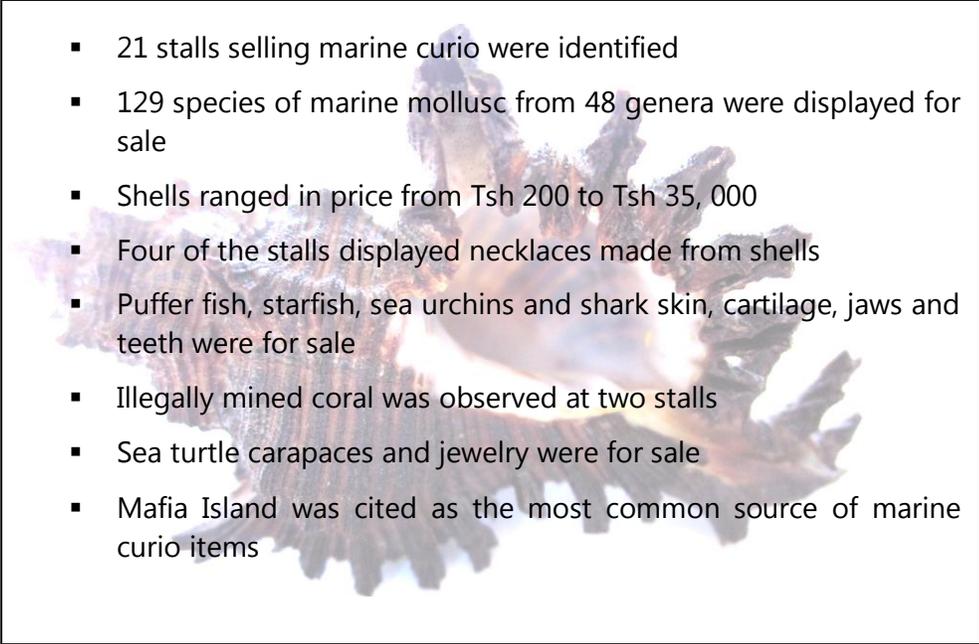
- Two live dugong sightings in 2012
- Both in Mafia District (Figure 5)
- One report of a gill net capture
- Dugong captured in Mafia and taken to Koma Island (Mkuranga District) for consumption

CETACEANS

Data on cetacean mortalities was collected by Conservation Officers during their routine foot patrols. In May, a dolphin was caught and killed by fishermen in Kilwa District and in July, a humpback whale was stranded near to Ngusimba village, also in Kilwa District. Sea Sense staff attempted to take photos of the stranded whale but were prevented from doing so by local villagers who were removing some of the whale body parts for their own use including bones, teeth and oil.

SURVEY OF MARINE CURIO TRADE

Sea Sense conducted a survey of the marine curio trade in Tanzania as part of a region wide analysis of the marine curio trade in the WIO, which was being compiled by the Marine Conservation Society (MCS) UK. Survey effort was concentrated at the Dar es Salaam fish market where a structured interview process was used to interview vendors. The Sea Sense team also asked more general questions to identify operational details of the trade including sources of curio items, customer profiles and market demands.

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- 21 stalls selling marine curio were identified
 - 129 species of marine mollusc from 48 genera were displayed for sale
 - Shells ranged in price from Tsh 200 to Tsh 35, 000
 - Four of the stalls displayed necklaces made from shells
 - Puffer fish, starfish, sea urchins and shark skin, cartilage, jaws and teeth were for sale
 - Illegally mined coral was observed at two stalls
 - Sea turtle carapaces and jewelry were for sale
 - Mafia Island was cited as the most common source of marine curio items

Regulation of the trade was poor and it was clear that many endangered and protected species were traded illegally. Although the marine curio trade in Tanzania provides tangible benefits for fishers, traders, cleaners and vendors it was difficult to quantify the exact economic value of the fishery. A full report of the regional survey is available from the Marine Conservation Society (www.mcsuk.org)

MANGROVE HABITAT RESTORATION

Sea Sense, Roots and Shoots group at the International School of Tanganyika (IST) and an environmental group in Visikini, Temeke District, collaborated to restore an area of mangrove forest which had been severely degraded due to intense harvesting of mangrove poles.



Mangrove planting in Visikini, Temeke District



Impact of species conservation programmes

Species conservation programmes have contributed to a greater understanding of sea turtle and dugong populations in Tanzania and have actively engaged coastal communities in marine conservation initiatives.

The flipper tagging programme provided the first data on clutch frequencies and duration of inter-nesting intervals of any nesting population in Tanzania. Detailed observations of nesting behaviour were essential to begin to build a more accurate picture of the nesting population in Juani Island.

The green turtle satellite telemetry project provided data on post nesting migratory routes and confirmed the location of important foraging grounds in Tanzania and the East Africa region, including one foraging ground utilised by gravid females. Green turtles nesting in other parts of the Western Indian Ocean (eg; Mayotte, Glorieuses Island) have also been tracked along the Tanzanian and Kenyan coasts, indicating that the East African coast is an important migratory corridor, thus highlighting the importance of the work being done at a regional level to identify high risk areas for migrating sea turtles in the Western Indian Ocean.

At a national level, satellite tracking data have been used as a means to raise awareness in coastal communities. Hence the value of this research cannot be overstated as it provides critical information for a conservation programme but equally importantly, it is an invaluable educational tool which is helping to change attitudes towards sea turtle conservation.

Analysis of stranding data has enabled Sea Sense to identify high risk areas to sea turtles. Communities with high levels of direct take have been targeted for education and sensitisation programmes and bycatch awareness sessions have been conducted in areas with high levels of fisheries related mortalities. Stranding data has also helped to identify the location of juvenile green turtle foraging and developmental grounds.

As a result of the monitoring carried out by the dugong stranding network, Sea Sense has identified a number of 'dugong hotspots' in the Rufiji Delta and those areas will be the focus of more intensive surveys to determine habitat quality and the level of threat from gill net bycatch. Sea Sense is also working with communities in the Delta to ensure dugong conservation measures are incorporated into local resource action plans.

OBJECTIVE 2: INCREASE CITIZENS KNOWLEDGE AND UNDERSTANDING OF COASTAL AND MARINE ECOSYSTEMS

BYCATCH AWARENESS

Sea Sense conducted bycatch awareness sessions in seven villages in Mafia District and four villages in Pangani District, specifically targeting gill net fishers. Village elders were invited to participate so they could provide historical information on the status of fisheries resources.

Specific topics included in the awareness sessions were:

- Impacts of bycatch on sea turtles and dugongs
- Techniques to release entangled sea turtles
- Impacts of illegal activities
- Links between conservation and livelihoods
- Managing migrant fishers
- Developing relationships and communicating with fisheries stakeholders
- Ownership of marine resources

There were a range of opinions related to the subject of bycatch but similar responses were observed in both Districts.

"I hit entangled turtles with a stick to get them out of my net"

"I don't bother to release live turtles as it takes too much time and causes damage to my net".

"I never think about the future".

"Dugongs are mermaids".



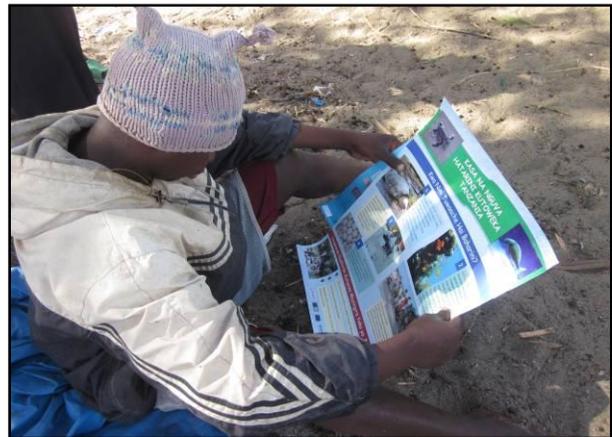
"Conservation is the responsibility of the Government".

"It is possible to release entangled turtles without destroying the net and without harming the turtle".

In Temeke District, Sea Sense engaged with six recently established Beach Management Units (BMU's) to increase their understanding of the impacts of illegal fishing and bycatch on sea turtles and their habitats. Three of the BMU's formed a Collaborative Fisheries Management Area (CFMA) and agreed that there was a need to establish a bycatch monitoring system to determine the true extent of the problem in their areas. Sea Sense intends to trial a bycatch monitoring system in Temeke District in 2013.

AWARENESS IN MIGRANT FISHER CAMPS

Sea Sense visited migrant fisher camps in Mafia and Rufiji Districts to conduct informal awareness raising about issues affecting marine and coastal resources including endangered marine species, waste management and the impacts of human activities on marine resources. Awareness posters were distributed.



Awareness meeting with migrant fishers in Mafia District

- Many of the migrant fishers admitted to slaughtering sea turtles regularly
- Evidence of materials used for dynamite and poison fishing were found at Simaya Island, Rufiji District
- Governance structures were absent at all camps
- Young children were observed living at the camps
- Waste management was a serious issue at all camps

COMMUNITY EVENTS

Community events were held in Mafia District to celebrate World Environment Day and World Sea Turtle Day and World Fisheries Day was celebrated in Rufiji District. A number of activities were organized by Sea Sense including cleaning of beach and public areas, school art and drama projects, tree planting and fun games and challenges.



Peer education



Handicrafts displays



Street clean-ups



Student art



Tree planting



Tug of War

Awareness materials were distributed to all that took part in the events.



Villagers participate in a World Fisheries Day event

“We need to
change for our
own good!”

PRIMARY SCHOOL KNOWLEDGE ASSESSMENT

Knowledge assessments were conducted in 16 schools in Pangani District to assess the impact of a teacher training workshop held in 2011. Discussions were held with teachers to assess the progress of the networks created during the workshop and pupils were asked to complete questionnaires to determine the success of any environmental education activities that had been implemented since the workshop.

During interviews and discussions at some schools, pupils demonstrated a good knowledge and understanding of the environment and a keen interest in the subject. Choba English Medium Primary School showed great success and teachers requested further training.

However, some teachers who attended the workshop had been transferred to other schools and had not implemented what they had learnt during the workshop or passed information on to their replacements.

SECONDARY SCHOOLS EDUCATION PROGRAMME

Sea Sense conducted a secondary school education programme in three secondary schools in

Mafia District and five secondary schools in Temeke District. The education programmes incorporated art activities to help students convey messages about the marine environment. The following topics were included:

- the 'ecosystem' concept
- keystone species
- biology of sea turtles and dugongs
- threats to their survival
- impacts of plastic pollution



- Level of knowledge on the marine environment was low
- Poor understanding of the impacts of human activities on the environment
- Students were unaware that deforestation and poor waste management could contribute to degradation of the marine environment.
- By the final session students had a keen interest and a broader understanding of the impacts of poor waste management
- Art is a useful tool to help students express their understanding of new concepts

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 encourage exchange of ideas and experiences.

In 2012, Sea Sense organized two TFD events in Pangani District in the villages of Kipumbwi and Mkwaja. In Kipumbwi village, fishing with beach seine nets and poor waste management were identified as key issues and in Mkwaja there were issues concerning illegal activities such as sea turtle slaughter, dynamite and poison fishing. 16 local 'artists' were trained in TFD skills including problem identification, story-telling and role playing. The TFD performances were specifically

designed to address the issues in each of the villages and following a week of training and rehearsals the performances took place with hundreds of villagers attending.



Creating a TFD storyline



Village 'artists' perform



Watching the performance

FILM SHOWS AND COMMUNITY DEBATES

Sea Sense organises marine conservation film and debate evenings in coastal communities, which are popular events that create lively discussions about marine conservation issues after the films have finished. Film shows were held in six villages in Pangani District, five villages in Temeke District and one village in Kilwa District.

Impact of education and awareness programmes

Sea Sense education programmes have contributed to an increased public awareness of the importance of marine species conservation and protection in Tanzania. As a result of bycatch awareness sessions, gill net fishers have a clearer understanding of the impacts of bycatch on sea turtles and now have the skills to be able to safely release entangled sea turtles from their nets. Reports of safe releases have been received from villages participating in the awareness sessions..

Through community awareness-raising events such as World Environment Day, World Fisheries Day and World Sea Turtle Day, Sea Sense has been able to reach large groups of people, across all age groups, genders and backgrounds. Theatre for Development performances in Pangani District have led to tangible transformations in community behaviour. As a direct result of the TFD performance in Kipumbwi, villagers now conduct a weekly village clean-up to address waste management issues in their community. The District Commissioner has also implemented a weekly clean up in Pangani Town.

Targeting schools pupils also proved to be an effective means of raising awareness about environmental issues and the importance of a clean and healthy environment. Tanzania has a young population, with 71% being under the age of 15 so school education programmes help to spread messages to a significant proportion of the population. Furthermore, environmental education is rarely taught in Tanzanian schools so pupils are very receptive to new information, particularly if taught in a fun interactive style.

Improved understanding of the impacts of illegal and unregulated resource extraction was demonstrated by migrant fishers in Simaya camp, Rufiji District. Following awareness sessions with Sea Sense, the fishers agreed to form their own leadership structure to take control of resource utilisation and improve management of the camp. They elected their leaders in the presence of Sea Sense, the District Fisheries Officer and Jaja BMU members and agreed to report to Pombwe village council and BMU.

OBJECTIVE 3: STRENGTHEN MULTI-LEVEL NATIONAL CAPACITY TO USE AND MANAGE COASTAL AND MARINE RESOURCES WISELY

Community Conservation Officers and Tour Guides

- Network of 34 active Conservation Officers in six districts
- Responsible for patrolling sea turtle nesting beaches, collecting data on sea turtle, dugongs and cetacean strandings, monitoring illegal activities such as dynamite fishing, coral mining and mangrove harvesting and conducting informal awareness raising in their communities
- New Conservation Officer recruited and trained in Mafia District to replace Conservation Officer in Baleni who retired after 11 years of service to Sea Sense
- Three Turtle Tour Guides responsible for managing sea turtle ecotourism programmes
- All Conservation Officers and Tour Guides involved in project planning and implementation
- Refresher training provided in practical sea turtle conservation techniques
- First Aid training provided to Conservation Officers and Tour Guide in Mafia District

DEVELOPING CAPACITY IN COLLABORATIVE FISHERIES MANAGEMENT AREA (CFMA) COMMITTEES

Sea Sense held dugong awareness workshops targeting the committees of DOKICHUNDA and JOJIBAKI CFMA's in Mafia District. The level of knowledge and understanding of the participants was assessed via group discussions and presentations.

Participants were reluctant to demonstrate knowledge of the historical status of dugongs and many participants stated that they were unaware of an existing dugong population in Tanzania. Participants were afraid to give information due to the fear of the establishment of a no take zone and subsequent loss of fishing rights.



Group discussions at the CCC workshops

Both CCC's had five year work plans and had set work targets to fulfil within five years. Three targets were mentioned: fighting against illegal activities through active patrolling; improving community livelihoods by identifying income generating activities and raising awareness of the importance of marine resource conservation.

The capacity to implement those targets was low. Further training needs were identified to address:

- Lack of commitment amongst some CFMA members
- Readiness of the community to manage fisheries resources collaboratively
- Poor dissemination of information within CFMA's
- Lack of knowledge of marine resource management amongst CFMA members
- Poor understanding of the importance of data collection and record keeping
- Lack of sustainable financing mechanisms for CFMA operations
- Political interference

To address some of the challenges stated above, follow up workshops were held in October 2012. Committees were asked in advance to prepare a report of their activities including successes and challenges they had encountered. However, the performance of the committees continued to be poor so few reports were forthcoming. Limited support from the District Fisheries Office continued to represent a significant challenge for CFMA implementation.

WORKSHOP ON SPATIAL AND TEMPORAL CLOSURES AS A MANAGEMENT TOOL

Sea Sense held a workshop in Rufiji District to improve awareness and understanding of the

benefits of spatial and temporal closures in conserving marine resources. Fishers, village councils and BMU leaders were invited to participate as their support was deemed critical for the acceptance of existing closures amongst the wider community.

Almost all of the participants were aware of and positive about spatial and temporal closures. Most participants believed that closure of the areas would help fish stocks to recover and by doing so would facilitate the development of a sustainable fishery resource. Fishers in particular had a high level of awareness of the closed areas but reported that migrant fishers continued to fish in closed areas and no action was taken against them, despite frequent reporting to BMU's, District Fisheries Officers and village leaders.

Mafia Island Marine Park was cited as an example of a thriving fisheries resource, which was partly due to the protection offered by certain closed areas within the park that acted as a breeding and nursery ground for fish stocks.

Some fishers believed that after the closure period they would be entitled to fish all species in the area including sea turtles and dugongs. Most of the participants did not see the closures as having any benefit for the conservation and protection of sea turtles or dugongs due to the belief that they were so rare and it was not possible to earn revenue from those species.

BEACH MANAGEMENT UNIT (BMU) TRAINING

Sea Sense implemented a training and capacity building programme for six BMU's in Temeke District. The programme focused on conservation of sea turtles since Temeke District is one of the most important green turtle nesting and foraging sites in Tanzania. Training modules included:

- sea turtle biology
- protection and conservation of threatened marine species (specifically sea turtles and their habitats)
- threats to sea turtle survival
- waste management
- significance of resource conservation in relation to coastal community livelihoods.



Participants agreed that they needed to do more to encourage their communities to protect marine resources and to support BMU's.

Sea Sense staff conducting BMU training sessions

SANAPA SEA TURTLE CONSERVATION AND ECOTOURISM TRAINING

Saadani National Park (SANAPA) is the only National Park in Tanzania that integrates sea, beach and terrestrial ecosystems. There is a small population of green turtles that nest on the beaches within the Park and SANAPA Rangers are involved in monitoring and protecting nests and recording sea turtle mortalities within the Park. In view of the important role SANAPA's Rangers have in sea turtle conservation, Sea Sense conducted a training workshop for seven Park Rangers to ensure sea turtle populations continue to be monitored and protected effectively.



Practical training for SANAPA Rangers

Theoretical training took place over the course of two days in a classroom environment and consisted of a series of lectures, presentations, discussions and DVD shows on sea turtle biology

and life history, threats to sea turtles, monitoring sea turtle populations and the value of sea turtle ecotourism.

The third and final training day consisted of training in practical sea turtle conservation techniques including beach patrol duties, sea turtle nest identification, nest monitoring, nest relocation protocols, nest excavation techniques and the process of collecting morphometric data from stranded specimens.

UNIVERSITY OF DAR ES SALAAM STUDENTS

Students from the University of Dar es Salaam completed an eight week placement at Sea Sense between July and September. The students undertook several administrative tasks in the Sea Sense office and supported the Sea Sense field team in the sea turtle satellite tagging programme.

Impact of capacity building programmes

The establishment of a network of community Conservation Officers has been central to the success of Sea Sense work programmes. Conservation Officers act as 'ambassadors for conservation' in their communities and provide a vital link between Sea Sense and the community. Many of the Conservation Officers have been working with Sea Sense for several years and have built a strong understanding of the need to manage marine resources sustainably. A number of Conservation Officers have been elected on to BMU and CFMA committees, which clearly demonstrates that their knowledge is respected within their communities.

Conservation Officers in Rufiji District reported that CFMA awareness workshops had brought about positive changes in their communities with stronger working relationships and higher levels of cooperation with village leaders developed as a result. CFMA progress in Mafia District was slower and further capacity building is needed in order to create an effective fisheries management organization.

Future capacity building programmes need to focus on District Authorities who play a critical role in BMU and CFMA implementation.

OBJECTIVE 4: STRENGTHEN LOCAL AND NATIONAL GOVERNANCE OF MARINE AND COASTAL RESOURCES

VILLAGE COUNCILS

Regular meetings were held in villages where Sea Sense is currently conducting marine conservation initiatives to elicit support for project activities and to ensure that communities remain fully aware of and engaged in Sea Sense activities. Meetings focused on:

- Provision of progress updates concerning Sea Sense activities
- Importance of strong leadership skills to encourage increased community support for marine resource conservation initiatives
- Discussions concerning the continuation of illegal activities, such as sea turtle slaughter, dynamite fishing and use of illegal nets and the need for village councils to be accountable to the wider community
- Discussions on how sea turtle ecotourism revenue can provide benefits to the community

DISTRICT AUTHORITIES

Sea Sense conducted regular courtesy calls to District Authorities to provide feedback on Sea Sense activities and solicit inputs for planned activities. Courtesy calls were typically made to the following offices / individuals:

- District Executive Director (DED)
- District Commissioner (DC)
- District Education Office (DEO)
- District Fisheries Office (DFO)
- District Natural Resources and/or Environment Office

MINISTRY OF LIVESTOCK AND FISHERIES DEVELOPMENT

Regular meetings were held with staff from Fisheries Development Division to provide feedback on Sea Sense work programmes, identify opportunities for collaboration and strengthen commitment to marine species and habitat protection.

TANZANIA TURTLE AND DUGONG CONSERVATION COMMITTEE (TTDCC)

To facilitate sea turtle and dugong conservation in Tanzania, a national committee has been established which coordinates all national initiatives related to research, conservation and management of sea turtles and dugongs. In 2012, the committee met twice to discuss and arrange a sea turtle survey in Lindi Region, share information on satellite and flipper tagging studies and progress a collaboration with James Cook University in Australia on dugong genetics.

Impact of governance agenda

Poor management and accountability within the fisheries sector has led to persistent degradation of coastal ecosystems and dramatic declines in populations of endangered marine species such as sea turtles and dugongs. It is therefore crucial that Sea Sense initiatives address the issue of poor governance at all levels of the governance chain from community up to national level. Sea Sense has built strong relationships with village councils, District Authorities and Fisheries Development Division and these links are used to strengthen understanding of what good governance means. Focusing on local governance issues also facilitated understanding of the factors that influence decisions, particularly those related to participation in illegal activities that degrade coastal ecosystems. Understanding incentives and choices helped Sea Sense to target education and sensitisation programmes effectively. Local governance issues were addressed during TFD performances in Pangani District and helped communities to understand that citizens have a right to expect good governance from their leaders.

As a result of these efforts, Sea Sense has observed a greater responsiveness from some village councils and improved governance amongst some BMU and CFMA committees.

OBJECTIVE 5: IMPROVE COASTAL LIVELIHOODS THROUGH SUPPORT FOR SUSTAINABLE REVENUE GENERATING ACTIVITIES

SEA TURTLE ECOTOURISM

Sea Sense has developed a sea turtle ecotourism initiative at three green turtle nesting sites. Members of the local community have been recruited as 'Turtle Tour Guides' and guide visitors to nesting beaches to watch sea turtle nests hatch.

Sea Sense has formed important partnerships with hotels and lodges in the vicinity of nesting beaches, which are involved in promoting sea turtle ecotourism to their guests and collecting donations to support the sea turtle conservation project. Sea Sense also partners with Authentic Tanzania Safaris to offer guided excursions to nesting beaches in Temeke District. A proportion of the cost of each trip is donated back to Sea Sense.

To strengthen support for sea turtle ecotourism and to ensure the welfare of the sea turtle hatchlings is protected, Sea Sense provided training in sea turtle conservation and Codes of Conduct for sea turtle viewing to tourism staff at partner hotels.

Sea Sense worked closely with two community turtle groups in Ushongo and Kikokwe villages in Pangani District to build skills and capacity for sea turtle conservation and ecotourism. The groups were actively relocating nests at risk of poaching, predation or tidal inundation and promoting sea turtle ecotourism amongst their communities and to visitors in their locality.



Local villagers at a sea turtle hatching event in Kikokwe, Pangani District

Sea turtle ecotourism is generating a sustainable source of revenue. Half of the revenue is retained by Sea Sense to help support sea turtle conservation programmes and the remaining half is donated to local communities. Sea Sense has established 'Village Environment Funds' in

several villages close to nesting beaches which receive annual donations from Sea Sense. The donations ensure that local communities see a clear connection between sea turtle conservation and economic benefits for their communities.

Table 2 shows revenue donated to six Village Environment Funds over the past three years.

Village	District	2010	2011	2012
Mbutu	Temeke	300,000	-	400,000
Minondo	Temeke	600,000	1,000,000	1,100,000
Kimbiji	Temeke	-	-	1,000,000
Yale Yale Puna	Temeke	-	-	200,000
Juani	Mafia	600,000	2,225,000	3,000,000
Ushongo	Pangani	-	500,000	500,000
Kikokwe	Pangani	-	250,000	250,000
		1,500,000	3,975,000	6,450,000

Table 2: Sea turtle ecotourism revenue (Tsh) donated to Village Environment Funds, 2010 - 2012

FLIP FLOP RECYCLING

One of the key threats to the growth of sea turtle ecotourism in Mafia District is the amount of plastic debris on sea turtle nesting beaches.



During 2012 Sea Sense started to raise money to establish a flip flop recycling project in Juani Island, Mafia District, similar to those conducted in coastal communities in Kenya and Mozambique. The project will help to reduce obstacles to nesting females and emerging hatchlings and generate an additional source of income through sale of the recycled handicrafts to tourists.

Plastic debris collected from a nesting beach in Juani Island



Examples of products made from recycled flip flops

Impact of livelihood projects

The sea turtle ecotourism initiative has proven to be hugely successful in helping communities to recognise the value of live sea turtles. Intentional slaughter of sea turtles for meat and poaching of eggs have been eliminated at all sea turtle ecotourism sites. Communities involved in sea turtle ecotourism now have a greater understanding of the importance of endangered marine species and habitat conservation and of the potential economic benefits associated with conservation.

Under their own initiative, a group of villagers in Pangani District have come together to form 'Kikokwe Turtle Conservation Group' and are actively relocating nests at risk from tidal inundation, monitoring them throughout the incubation period. Their aim is to set up their own sea turtle ecotourism project. Sea Sense has provided training to the group and gives assistance and advice as needed. The village council has also recognised the importance of education and training and has requested further support from Sea Sense to build skills and capacity for sea turtle conservation and ecotourism. This represents a major change in attitude and behaviour amongst Kikokwe villagers who were regular poachers of sea turtle eggs, prior to engagement with Sea Sense.

Owners of several lodges have made private donations to Sea Sense, which demonstrates an increased awareness amongst the private sector of the importance of community driven conservation initiatives and gives good recognition of the support provided by Sea Sense.

OBJECTIVE 6: COLLECT, PUBLISH AND DISSEMINATE PROJECT RESULTS TO NATIONAL, REGIONAL AND INTERNATIONAL STAKEHOLDERS

- Journalist Study Tour to Pangani District to promote Sea Sense work. Subsequent media reports appeared on TV, radio and in newspaper print with large coverage throughout Tanzania
- Sea Sense was Septembers 'profile of the month' on the IOSEA Marine Turtle website
- Monthly articles published in Dar es Salaam Yacht Club magazine
- Articles published in two popular magazines ('*What's Happening in Dar*' and '*Salt and Pepper*').
- Sea Sense stall at Dar es Salaam Charity Goat Races
- News items and project activities highlighted on Sea Sense website and Facebook page
- Promotion of sea turtle adoption programme
- Poster and oral presentations at 32nd International Sea Turtle Symposium in Mexico
- Presentation at 4th meeting of the Western Indian Ocean Marine Turtle Taskforce in South Africa

4. PROBLEMS ENCOUNTERED

Although illegal and highly dangerous, **dynamite fishing** continues unabated along much of the Tanzanian coast. Dynamite fishing has been reported as commonplace in Temeke District and around Kilwa Kivinje in Kilwa District, Pombwe in Rufiji District, Mtwara, Lindi and Tanga, within the Tanga Coelacanth Marine Park.

The issue of dynamite fishing reaches beyond the mandate of the Ministry of Livestock and Fisheries Development. The Ministry of Energy and Minerals is responsible for issuing licenses for the purchase of explosives by artisanal miners yet it is apparent that these licenses are being used illegally by dynamite fishers to purchase explosives. The poor regulation of explosives also

represents a national security issue.



Examples of explosives used to catch fish in Lindi District

Illegal **coral mining** for lime production for use in the construction industry occurs extensively, with much of the lime transported for sale elsewhere in Tanzania, amid a lack of regulation by District Authorities.

Mangrove harvesting for construction and for access to bait collection is common place. Mangroves in Kilwa and Rufiji Districts are subject to significant and unregulated harvesting with much of the mangrove wood transported illegally to Zanzibar.



Extensive mangrove clearance in Kilwa District

Poor waste management represents a significant threat to the marine environment and for communities throughout Tanzania. Most Districts lack a system for waste collection and disposal. Of particular concern is the amount of plastic debris washed up on sea turtle nesting beaches in Juani Island, Mafia District. The debris poses a considerable threat to nesting sea turtles and emerging hatchlings.



Plastic debris on a sea turtle nesting beach in Juani Island

Limited enforcement of laws protecting threatened marine species and their habitats poses a major challenge. Poor governance of the fisheries sector has resulted in continued illegal exploitation of marine resources with limited accountability amongst those responsible for managing marine resources.

5. FUNDING

5.1 WORLD WIDE FUND FOR NATURE (WWF)

In July 2012, Sea Sense entered into the third and final year of the WWF funding period, which supports threatened marine species conservation in Mafia, Rufiji and Kilwa Districts. In 2012, sea turtle work focused specifically on sea turtle monitoring through flipper tagging and satellite tracking and on the development of sea turtle ecotourism in Mafia District. In Rufiji and Kilwa Districts, dugong conservation activities were implemented through the CFMA process and workshops were held on spatial and temporal closures as a management tool.

5.2 US AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)

2012 saw the completion of a third year of funding from USAID that supports sea turtle protection in Pangani District. During year three of the project, Sea Sense monitored and protected sea turtle nests at eight nesting beaches and conducted several training, education and awareness raising events, including training in sea turtle conservation and ecotourism for seven SANAPA Rangers, bycatch awareness sessions with fishers in seven villages and Theatre for Development projects in two villages. A fourth and final year of funding will continue into 2013.

5.3 BORN FREE FOUNDATION (BFF)

During 2012, BFF provided essential funds to cover project overheads including staff salaries, office rent, insurance and annual audit costs. BFF also partnered with Sea Sense on the Global Friends Programme, providing support for primary schools in Mafia District through the provision of education materials and infrastructure improvements. In 2012, Global Friends Programme funds were used to purchase books and pens for a primary school in Bweni village and sports equipment to promote sports as an important part of the school curriculum in Juani village. Funds were also used to build bathrooms and latrines for staff at Juani Primary School.



New latrine block for teachers at Juani Primary School, Mafia Island

5.4 FAUNA AND FLORA INTERNATIONAL (FFI)

Sea Sense was awarded a grant by the FFI Flagship Species Fund. Funds were used to support community based sea turtle monitoring in Temeke District, capacity building programmes for five Beach Management Units and a sea turtle community awareness campaign. The programme runs from March 2012 to February 2013.

5.5 INTERNATIONAL SEAFOOD SUSTAINABILITY FOUNDATION (ISSF)

In 2012, Sea Sense secured funding from ISSF to improve the conservation status of endangered sea turtles in Temeke District. Funds are being used to support capacity building work with BMU's and District Authorities, to raise awareness of the impacts of illegal fishing and sea turtle bycatch and to improve the release rate of captured turtles. The programme runs from October 2012 to September 2013.

5.6 CONVENTION ON MIGRATORY SPECIES (CMS)

In May 2012, Sea Sense was awarded a grant from CMS to address data gaps related to sea turtle populations in Temeke District. Funds from CMS are being used to support the daily monitoring activities of the Conservation Officer network and to implement a flipper tagging programme during the two month peak nesting season (April and May) in order to fill data gaps on clutch frequency, inter-nesting intervals and nest site fidelity. The programme will run from October 2012 to September 2013.

5.7 INTERNATIONAL SEA TURTLE SOCIETY (ISTS)

Sea Sense was awarded a grant from the ISTS Media and Communications Fund. The fund is awarded for the production and distribution of information or other materials that promote the exchange of information to advance the global knowledge of sea turtle biology and conservation. Sea Sense intends to produce a sea turtle 'kanga' to raise awareness amongst women in coastal communities.

6. AIMS FOR 2013

- Continue endangered marine species monitoring and protection in six coastal districts
- Conduct saturation flipper tagging programmes in Juani and Temeke Districts
- Deploy four satellite tags on nesting green turtles
- Conduct sea turtle awareness activities in Songo Songo Islands
- Assess sea turtle status in Zanzibar Archipelago
- Promote sea turtle ecotourism initiative in Mafia, Pangani and Temeke Districts
- Conduct 'Theatre for Development' project in Pangani and Temeke Districts
- Deliver secondary school marine education programme in Pangani District
- Conduct an endangered marine species awareness workshop for Ward Representatives in Mafia District
- Conduct a dynamite fishing awareness campaign targeting female fish traders in Temeke District
- Hold community events to celebrate World Environment Day and World Fisheries Day
- Produce and distribute a sea turtle 'khang'a'
- Strengthen capacity of newly established BMU's in Temeke District
- Trial bycatch monitoring system in Temeke District
- Hold BMU stakeholder meetings in Temeke District
- Facilitate implementation of waste management bylaws in Pangani District
- Produce a National Sea Turtle Status Report
- Develop a five year strategy for Sea Sense
- Attend and present at WIOMSA and ISTS symposia
- Secure further funding for Sea Sense marine conservation activities

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