



Indian Ocean – South-East Asian Marine Turtle Memorandum of Understanding



United Republic of Tanzania

GENERAL INFORMATION

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Tanzania Mainland and the Department of Fisheries and Marine Resources of the Ministry of Agriculture, Cooperatives and Environment, Zanzibar.

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OBJECTIVE I. REDUCE DIRECT AND INDIRECT CAUSES OF MARINE TURTLE MORTALITY

1.1 Introduction to marine turtle populations and habitats, challenges and conservation efforts. [INF]

Tanzania's mainland coastline, together with Zanzibar and numerous smaller offshore islands, provides important feeding and breeding habitats for five of the world's seven sea turtle species: leatherback (*Dermochelys coriacea*), green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), loggerhead (*Caretta caretta*) and olive ridley (*Lepidochelys olivacea*) turtles. Green turtles are the most common species and are reported to nest throughout most of the coastline. Hawksbills are also widely distributed in Tanzania but are only known to nest in small numbers on off-shore islands. Very little information is available on olive ridley, loggerhead and leatherback turtles although they are thought to forage in Tanzanian waters and pass through en route to nesting sites elsewhere in the region.

The status of turtles in Tanzania was first assessed in the mid-1970s when populations of all species were reported to be declining. Although afforded complete protection under national fisheries legislation, turtle populations in mainland Tanzania continue to face threats from subsistence harvesting for meat, poaching of eggs, incidental capture in gill nets and habitat disturbance (Bourjea et al., 2008). Inshore commercial prawn trawlers also pose a significant threat (Joynson-Hicks & Ngatunga, 2009). Tourism development leading to destruction of nesting beaches is a major concern for turtle populations in Zanzibar (Bourjea et al., 2008).

Since the early 1990s, several conservation and management initiatives have been implemented in some areas.

However, these only cover approximately a third of the coast and information concerning turtle habitats, population dynamics and levels of threat is incomplete.

Green Turtle:

The green turtle is the most common nesting species in Tanzania. Population size estimates from the mid-1970s put the total number of green turtles nesting in the whole of Tanzania at approximately 300 (Frazier 1976). In view of the fact that green turtle nesting data across Tanzania is yet to be systematically analysed, it is difficult to know with certainty whether nesting populations of green turtles have declined since the estimate made over 30 years ago.

However the annual nesting population of green turtles in Tanzania is thought to be about 150. The most concentrated nesting occurs on the islands of the Mafia archipelago although there are also important nesting sites in Zanzibar and in Temeke, Pangani and Mtwara Districts. Nesting also occurs in Mkuranga, Rufiji and Kilwa Districts although nesting density is very low in these areas (less than 10 per year).

While low density nesting has been reported along the mainland coast from Tanga in the north to Mtwara in the south, the most concentrated numbers of nests appear to be on the offshore islands of Zanzibar, Mafia and possibly the Songo Songo archipelago. The main nesting season is between February and July (Muir 2005b).

Hawksbill turtle:

Hawksbills are also widely distributed but are less abundant. There are few records of hawksbill nests in Tanzania. All those that have been recorded have been on small remote offshore islands such as Misali and Mnemba Islands in Zanzibar, the small islands off Dar es Salaam, Shungi-mbili Island and Juani Islands in Mafia, Mbudya and the Songo Songo archipelago.

The most important nesting sites in Tanzania are Misali Island, off Pemba, and Mafia Island. On Misali Island, 42 hawksbill nests were recorded between 1998 and 2002, peaking during the month of March, while on Mafia Island, 30 hawksbill nests were recorded between 2001 and 2008, of which 16 were laid on Shungi-mbili Island in the north west and 14 on the east coast at Juani and Kungwi. The main nesting season is during the northeast monsoon between December and April. Although no animals bearing tags from other countries of the region have been recorded, the hawksbill is a migratory species so it is probable that Tanzania harbours both residents and migrants (Muir 2005b).

It is likely that some hawksbill nests go unrecorded due to the inaccessibility of some of these islands at certain times of the year. Only one hawksbill nest has been recorded on the mainland coast which was in Mnazi Bay - Ruvuma Estuary Marine Park in 2005.

Olive Ridley turtle:

Little is known about the status of olive ridley turtles in Tanzania although they are no longer reported to nest. They were observed nesting on Maziwe Island south of Tanga in the mid-1970s but the island has subsequently submerged and no further nesting records for this species have been made anywhere on the Tanzanian mainland or on offshore islands. (Muir 2005b). Local fishers note that they are occasionally accidentally caught in gillnets along the Tanzania coast and net captures have been confirmed in Mtwara, near the border with Mozambique. These net captures were confirmed in MBREMP in 2003 when several dead animals were photographed.

Loggerhead turtle:

Loggerhead turtles are relatively rare in Tanzania and there is no indication that they nest. However, evidence from tag returns of individuals caught in nets off Mtwara and Mafia indicate that southern Tanzania and the Mafia area are important foraging grounds for loggerheads nesting in Tongaland and Natal, South Africa. Three tagged animals were caught in southern Tanzania in 1976. One animal swam a distance of at least 2,640km in 66 days between its release in Natal and its capture at Kilwa Masoko and a second animal accomplished a similar feat (Frazier 1976). Since 2001, tags have been recovered by Sea Sense from 5 loggerhead turtles caught in gillnets: 3 at Jibondo Island off southeast Mafia, and 2 off Songo Songo Island (Muir 2005b). All were tagged while nesting in Tongaland and Natal in South Africa (Muir 2003). During a prawn trawl bycatch survey in 2007, a loggerhead was caught and recorded in a net (Muir and Ngatunga in prep).

Leatherback turtle:

Very little information is available on leatherback turtles in Tanzania because they are so rarely sighted and because indigenous knowledge is limited. Although the leatherback was noted as nesting in Zanzibar in the 1970s (Frazier 1976), there have been no further records of this species nesting in Tanzania. In 1997/1998, five leatherback turtles, mostly dead individuals, were recorded from Unguja Island (Khatib 1998). Occasional net captures and opportunistic sightings of leatherback turtles also indicate that this species forages in Tanzanian waters. Two leatherback turtles were caught in offshore waters on Pemba Island in 1997 (Slade et al. 1997). Three individuals were washed up on Mafia beaches in 2002 and 2003 (C Muir, *pers. obs.*) and another was released by fishers from a net in Kilwa in 2010 (L West, *pers. comms.*) This suggests that they may feed in the area or are migrating to nesting sites in Natal.

Note: Potentially important nesting and feeding sites in Tanga, Muheza, Pangani and Lindi districts remain un-surveyed because of funding and resource limitations.

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Foraging and developmental grounds: There are significant data gaps in relation to key sea turtle foraging grounds in Tanzania. Most information is anecdotal from local fishers and tourism operators. However, Tanzania harbours extensive seagrass beds and coral reefs which can support considerable numbers of turtles (Howell and Mbindo 1996). Seagrass beds are found in abundance in sheltered areas of the coast around Mwa in Tanga and tidal zones fronting the deltas of the Ruvu, Wami and Rufiji rivers although the actual area covered by seagrass beds and the relative species densities have not been established in Tanzania. The extensive seagrass beds off the southern Rufiji Delta (Kichinja Mbuzi and Toshi), including Mohoro Bay (Fungu ya Kasa), are reported by local residents to be important feeding grounds for green turtles. On Mafia Island, immature and adult green and hawksbill turtles are seen regularly by recreational divers in Chole Bay and along the east coast of Juani Island where seagrass and corals occur. Off Ras Kisimani on the west coast of Mafia, green turtles have been observed digging pits in the sand at a depth of 10-15 meters where they appear to rest (Muir 2005b). These areas are within the boundaries of Mafia Island Marine Park.

In Mtwara, records of green and hawksbill turtle sightings from dive surveys and questionnaire surveys indicate that important turtle foraging habitats exist in Mnazi Bay and off Msimbati (Guard et al. 1998; Muir 2003). In Zanzibar, green and hawksbill turtles are regularly sighted by divers at Nungwi and the coral reefs around Mnemba Island. The main turtle developmental habitat, where small and immature green and hawksbill turtles concentrate, is Uroa in the Central District of Unguja. The area comprises seagrasses, corals and algae and, as late as 1996, was unprotected (Khatib et al. 1996). The reefs off Zanzibar are also reported to be important feeding grounds for loggerhead and leatherback turtles (Khatib et al. 1996).

Juvenile stage: There is a significant data gap on recruitment and behaviour of juvenile sea turtles in Tanzanian waters. Most information is anecdotal from at sea observations from fishers and tourism operators.

In Zanzibar, the main turtle developmental habitat, where small and immature green and hawksbill turtles concentrate, is reported to be in Uroa in the Central District of Unguja. The area comprises seagrasses, corals and algae and is unprotected (Khatib et al., 1996).

Stranding records for juvenile green and hawksbill turtles exist from many coastal districts with CCL measurements as little as 18cm indicating that Tanzanian waters do support juvenile populations.

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Some of the most important causes of turtle mortality in Tanzania include: incidental capture in gillnets from artisanal/subsistence fishing, incidental capture by commercial prawn trawls, disturbance of nesting beaches from tourism development (coastal development), human disturbances and light pollution on nesting beaches (by tourists, seasonal fisher camps), pollution (including sewage, chemical pollutants and plastic / macrodebris), and subsistence harvesting of nesting and foraging turtles and their eggs, damage to seagrass and coral reef habitat from trawling and destructive fishing gears such as seine nets and dynamiting; lack of law enforcement; and non-human predation (Thiagarajan 1991; Clark and Khatib 1993; Slade 2000; Muir 2005b; Muir 2007b).

Habitat destruction caused by erosion, in some cases the result of coastal developments, live coral mining, destructive prawn trawling practices, and clearing of mangroves are also threatening sea turtles (Khatib 1998; Muir 2007b). The threat of erosion is illustrated by the case of Maziwe Island which submerged in the 1980s. In Zanzibar, a study commissioned by the Department of Environment, indicates that the coastline is being eroded at a rate of 1-3 meters a year. The areas most threatened in Unguja include Nungwi, Bwejuu, Jambiani and Mnemba Island (Khatib 1998). Since 2001, the island of Shungi-mbili has been severely eroded, partly from natural causes and partly due to felling of vegetation by fishermen to supply firewood and to cure sea cucumbers. This has led to the creation of very steep beach walls which turtles have difficulty climbing to nest, and an increase in the general level of activity on the island with reduced space available for fishers to camp. This has resulted in a reduction in the number of turtles that nest on Shungi-mbili Island, and those that do, typically lay their eggs below the sand wall where the eggs are inundated (Muir 2005b).

Tanzania has 10 coastal protected areas (Muir 2005b). The country also has legislation in place that provides protection to turtles, although nests are not adequately covered by law; (Slade 2000; Muir 2005b); however poor law enforcement is hampering the effective protection of sea turtles in Tanzania (Slade 2000; Muir 2005b; Muir 2007b).

1.2.1 Describe any protocol or approaches practiced in your country, which you consider exemplary, for minimising threats to marine turtle populations and their habitats, which may be suitable for adaptation and adoption elsewhere. [BPR]

Reduction of egg harvesting:

Traditionally, turtle egg collection has been ubiquitous along the Tanzanian coast, and, unlike the killing of turtles themselves, is not generally perceived to be contravening the law. Evidence of egg collection has been observed along

the coast at Saadani, Temeke, Mapanya Island (Mkuranga), Rufiji, Kilwa and Mtwara.

However, at sites in coastal districts where effective community monitoring and conservation education are underway, the threat of egg harvesting has been significantly reduced. On Mafia Island, for example, 49% of nests recorded during the first year of monitoring by Sea Sense were poached by local fishers (Muir 2005b). However, in 2002, following the implementation of beach patrols, the introduction of nest protection incentive scheme and a public awareness campaign, the incidence of poaching fell to 8% and declined further to less than 1% in 2003 and 2004 (Muir 2004). A similar change in behaviour has been recorded in MBREMP where the number of nests poached fell from 100% in 2003 to 0% in 2004 following initiation of a turtle conservation programme (Mahenge 2004). In Temeke district, since monitoring began in July 2004, only 1 (6%) out of 16 nests recorded has been poached (Muir 2005b).

Community members who find and report a nest are given a small financial incentive. Further payment is given for every egg that hatches successfully (total of approx \$13 per nest). Poaching in Mafia remains at approximately 2% with 4 out of 252 nests poached in 2008 (West, 2009). The frequency of poaching at other key mainland sites (Temeke District) has also reduced over the past four years of monitoring. In 2005, 3 out of 68 (4%) nests were poached compared with 2 out of 143 (1%) nests in 2008 (Sea Sense, *unpublished data*). Monitoring programme:

In January 2001, a community-based marine conservation initiative (by Sea Sense) was established in Mafia district (Mafia Island) to promote the long-term survival of endangered marine species and habitats, in collaboration with Mafia District Council, Mafia Island Marine Park and local communities. Direct conservation, monitoring, tagging, public awareness, training and research are undertaken by a team of 8 village-elected "Conservation Officers". A nest protection incentive scheme was initiated in 2002. Under this scheme, individuals who report a nest receive an initial reward of USD\$3 once the nest is verified. They assist the turtle monitor in protecting the nest from human and non-human predators during the incubation period and are rewarded with a second payment of USD 0.40 for every successful hatchling and USD 0.20 for every rotten egg.

In 2004, Sea Sense scaled up activities to the mainland coast and is now working in Bagamoyo, Temeke, Mkuranga, Kilwa and Rufiji Districts with the assistance of over 50 Conservation Officers.

On Zanzibar and Mafia, involvement of local communities in nest protection, monitoring, data collection and awareness raising has played a key role in reducing threats to turtles. The provision of financial incentives is a conservation option, and is practiced in some areas in the region. There are of course dangers associated with incentive-driven conservation, the most important of which is financial sustainability. However, in areas where mortality (through turtle and egg poaching) has reached critical levels, financial rewards may be the only realistic short-term solution. In the longer term it may be possible to generate revenue to fund turtle conservation through turtle tourism and park entry fees (Muir 2005b).

On Zanzibar, cash incentives have been found to be counter-productive to obtaining committed public participation (Khatib et al. 1996). However, in Mafia and Mtwara modest incentives, averaging US\$7 and US\$3 per nest respectively, have proven highly effective in involving local communities and in protecting nests (Muir 2005b).

Turtle Excluder Devices (TEDs):

TEDs are not mandatory under Tanzanian Fisheries Law. However there have been a number of meetings and workshops with a range of stakeholders to discuss issues surrounding the used of TEDS. TAFIRI is planning TED trials in 2010.

Collaborative Fisheries Management Areas (CFMAs):

CFMAs have been implemented in several coastal districts whereby geographical coastal and marine areas are designated for local management using legislative and administrative processes. CFMA's are intended to protect, conserve, manage and develop a variety of fishery resources and encourage their wise use. They are identified, planned and established through Beach Management Units (BMUs) in Tanzania's coastal fishing communities. Area management plans have been developed in consultation with the Fisheries Development Division, Local Government, District Authorities, BMU's, NGOs and the wider fishing community.

As a direct result of CFMA's, the incidence of illegal fishing has reduced in some areas. Boundary conflicts have been resolved and revenue collection systems have been improved. Conservation and protection measures for endangered marine species, including sea turtles have also been incorporated into a number of action plans. Temporary (two years) and spatial closures of four reefs supporting foraging populations of sea turtles were approved in May 2010 by CFMA's in Rufiji and Kilwa Districts.

Based on the negative perception which existed in the coastal community prior to CFMA implementation, initiation of reef closures is a significant success and will contribute to the regeneration of critical habitat and help to reduce mortality from gill net bycatch.

In 2008, due to high levels of predation by mongoose, honey badgers and monitor lizards in Temeke District, protective nets were placed over several nests using techniques described in Boulon, Jr, 1999. Such strategies have proven reasonably effective in deterring some predators. 26 out of 428 (6%) nests were predated in 2008 (West, 2009) compared with 39 out of 305 (13%) nests in 2007 (Muir, 2007). However, predation by ants (*Solenopsis* spp) remains an ongoing problem due to the ants' ability to establish underground trails to turtle nests (Buhlmann & Coffman, 2001).

1.3.1 Describe any socio-economic studies or activities that have been conducted among communities that interact with marine turtles and their habitats. [BPR, INF]

A number of studies address resource-use by coastal communities, the economic value of turtle products and the cultural / social implications of human-turtle interactions:

Clark, F. 1992. Pemba sea turtle survey: report on pre-survey training workshop for village contacts.

Clark, F. and Khatib, A.A. 1993. Sea turtles in Zanzibar: status, distribution, management options and local perspectives. Zanzibar Environmental Study Series No. 15b. The Commission for Lands and Environment, Zanzibar.

Darwall, W.R.T. 1996. Marine biological and marine resource use surveys in the Songo Songo archipelago, Tanzania. Report no. 3: Simaya Island. The Society for Environmental Exploration and the University of Dar es Salaam.

Darwall, W.R.T. and Choiseul, VM. 1996. Marine biological and marine resource use surveys in the Songo Songo archipelago, Tanzania. Report no. 4: Okuza Island. The Society for Environmental Exploration and the University of Dar es Salaam.

Mack, D., Duplaix, N. and Wells, S. 1995. Sea turtles, animals of divisible parts: international trade in sea turtle products. In: K A Bjorndal (Ed), *Biology and Conservation of Sea Turtles*, Revised Edition. Smithsonian Institution Press, Washington DC. 619 pp.

Muir, C.E. 2005b. The status of marine turtles in the United Republic of Tanzania, East Africa. Sea Sense Report (Tanzania Turtle and Dugong Conservation Programme).

Muir, C.E. 2007a. Sea Sense Technical Report: June 2007. 1-9 p.

Muir, C.E. 2007b. Community-based endangered marine species conservation: Tanzania.

Ngusaru, A.S., Tobey, J. and Luhikula, G. 2001. Tanzania State of the Coast 2001: People and the Environment. Tanzania Coastal Management Partnership, Science and Technical Working Group, Dar es Salaam.

Semesi, A.K., Mgaya, Y., Muroke, M.H.S., Francis, J., Mtolera, M. and Msumi, G. 1998. Coastal resources utilisation issues in Bagamoyo, Tanzania. *Ambio*, 27: 635-644.

Tanzania Coastal Management Partnership. 2003. Tanzania: State of the coast: The national ICM strategy and prospects for poverty reduction.

1.3.2 Which of these adverse economic incentives are underlying threats to marine turtles in your country? [TSH]

■ High prices earned from turtle products relative to other commodities

- Lack of affordable alternatives to turtle products
- Ease of access to the turtle resource (eg. by virtue of proximity or ease of land/water access)
- Low cost of land near nesting beaches

■ Low penalties against illegal harvesting

- Other1:
- Other2:
- Other3:
- None of the above or Not Applicable

(Clark and Khatib 1993; Muir 2007b)

1.3.3 Has your country has taken any measures to try to correct these adverse economic incentives? [BPR]

YES NO NOT APPLICABLE (no adverse economic incentives exist)

Sea Sense, a Tanzanian NGO, is developing alternative livelihoods in the form of training and employing conservation officers (Muir 2007b). The use of cash incentives to encourage the protection of nests, has in some cases been a successful conservation tool (Muir 2005b).

1.4.1 Indicate, and describe in more detail, the main fisheries occurring in the waters of your country, as well as any high seas fisheries in which flag vessels of your country participate, that could possibly interact with marine turtles. [INF]

a) *Shrimp trawls*: YES NO

Commercial trawling started in Tanzania in the late 1960s and, by around 2005, a maximum of 25 vessels currently operate along the coast in 3 zones (Muir 2005b; Muir 2006 unpublished). The prawn trawling season is open for 8 months of the year between April and November (inclusive; Richmond et al. 2002). Apart from several exclusion areas in Tanga region, trawling is unrestricted. Prawn hotspots exist at Mchungu and Jaja off the Rufiji delta and at times when good prawn concentrations are found, a maximum of 14 vessels might be fishing this area (Muir 2005b).

Industrial prawn trawl fishing started in Tanzania in 1988 at which time there were 13 licensed vessels. In 1995, the fishing effort rose to 18 vessels and continued to increase to 25 vessels in 2003/4 with catches fluctuating between 688mt to 1,320.1mt (Tanzania Fisheries Research Institute, 2006). Studies of prawn exploitation in Tanzania indicated that there had been a significant reduction in biomass and yields since 1992 (Sanders, 1989; Nhwani et al 1993; Bwathondi et al., 2001) and that the fishery was being overexploited. Consequently, in 2001 it was recommended that the number of vessels licensed to trawl in Tanzania be reduced from 20 to eight. In 2006, 13 licensed prawn trawlers were operating in Tanzania (Anon. 2006) and in 2007 there were ten.

Zonation along the coast helps to distribute fishing pressure. There are three Zones: Zone 1 from the Kenya border to Bagamoyo; Zone 2 from Temeke to the Rufiji Delta; and Zone 3 from the Rufiji Delta to Mtwara. The most productive area for prawns is at the boundary of Zones 2 and 3 off the Rufiji Delta.

Trawling vessels focus efforts in shallow estuarine environments during the season which runs from 01 April to 30 October. However, in 2007, the season did not start until June due to a paucity of prawns during the previous three years. Vessels are foreign owned, but must be registered in Tanzania where they are licensed to access territorial waters and land catch. Prawn hotspots exist at Mchungu and Jaja off the Rufiji Delta and at times when good prawn concentrations are found, a maximum of 14 vessels might be fishing this area (Muir 2005). Tanzanian prawns are sold in Europe.

A survey of the Tanzanian industrial prawn trawl fishery was conducted between June and September 2007 to determine the level of incidental capture of marine turtles and mammals (Joynson-Hicks & Ngatunga, 2009). Trained observers from the Tanzania Fisheries Research Institute (TAFIRI) and the Prawn Trawl Association assisted with data collection. Data were collected from six vessels in each of the three fishing zones. The average number of fishing days per month was 26 with each vessel pulling a maximum of four hauls a day for a soak time of 2.5 to 3 hours. 16 turtles were caught in five of the vessels. Three species were caught: green (62.5% of total), hawksbill (19% of total) and loggerhead (12.5% of total). Most were caught in Zones 1 and 2 during August. With a fleet of ten vessels (the number licensed in 2007) it is estimated that 54 turtles are caught annually. The size of the turtles captured ranged from 43 to 120 cm curved carapace length (CCL). The average turtle carapace length was 70.87cm (SD +/- 24). Both sub-adults (CCL 35 – 75cm) and adults (>75cm) were caught but most captures were of sub-adults (69%). Both male and female turtles were recorded including an adult green female who may have been offshore prior to nesting.

Only two species, green and hawksbill, nest in Tanzania. The population of nesting hawksbill turtles is small (<10 a year) and they tend to nest on small offshore islands rather than on the mainland beaches between November and March during the north-east monsoon. This corresponds to the closed prawn trawl season. Conversely, green turtles nest in greater numbers (approx 300 a year) both on the mainland and islands throughout the year peaking in April and May when the prawn trawl season is open. This indicates that reproductive green turtles are more threatened by this fishery than hawksbills. In 2007 the season did not open until June and therefore it was not possible to establish whether greater numbers of turtles are caught during the peak reproductive season when they congregate offshore to mate.

In January 2008, the Tanzania Prawn Trawl Association proposed a closure of the industrial prawn trawl fishery for two years between 2008 and 2010 due to declining prawn yields, destruction of the benthic environment and to allow research on maximum sustainable yields to be carried out. The closure has since been extended for a further year. Upon reopening, it proposed that no new licenses be issued.

b) Set gill nets: YES NO

Gillnets, with a mesh size of 5-6 inches (about 18 cm; local name: soni) are used to target catfish, emperor fish, grouper, parrot fish and trevally. Gillnets with a mesh size of 10+ inches (36 cm; local name: sinia) target sharks and rays (Berachi, 2003). Both types of gill net pose a threat to all species and age classes of sea turtle in Tanzania (Thiagarajan, 1991) although nets with a larger mesh size pose a more serious threat. Most captures are incidental. However, at some key known foraging grounds, nets have been set deliberately to catch turtles (Slade 2000). Such sites include Ras Fikirini (west Mafia), Matanango and Nanano reefs off Msimbati in MBREMP, and Kimbiji (Temeke district).

In 2007, a sea turtle bycatch survey was conducted at eight fish landing sites in five coastal districts in 2007 (Muir & Ngatunga, 2007). 144 interviews were conducted with gill net fishers. All reported to use locally-crafted wooden sailing boats (mashua) measuring between 5 – 9 meters in length. Few have outboard engines. The average crew size for the gillnet fishery is between four to six fishermen and nets range in length from 100m up to 1,800m. Gillnet fishers tend to fish during neap tides when the current is not so strong, fishing between six and 20 days a month. The nets are typically set in the evening and pulled 12 to 24 hours later at depths of between 10m and 40m.

At all sites except Nyamisati in Rufiji, gillnet fishers reported that they fish throughout the year, with greater intensity during the SE monsoon. Gillnet fishers from Nyamisati said that they fish between May and October.

Of the 144 gillnet fishers interviewed, 49 (34%) admitted to having caught a turtle in their net. Reported turtle captures were spatially uniform except at Nyamisati where none were reported. This is as expected as Nyamisati village is situated in the Rufiji Delta mouth where there is a heavy sediment load, fresh water and extensive mangrove forests, not suitable for nesting or foraging turtles. The main seagrass beds in the delta area are to the south near to Somanga where both turtles and dugongs were reported to get caught in nets.

A survey of gillnet fishers in Mkuranga District in 2008, indicated high levels of turtle bycatch. 48 fishers participated in the survey, of which 39 regularly used gill nets, mostly bottom set. Nets ranged from 5m to 700 m in length. 77% (n: 30) of the gill net fishers reported catching sea turtles on a monthly basis. Almost all (n: 28) were using sinia with a mesh size of 10 – 12 inches.

Analysis of sea turtle stranding data for the period July 2004 – July 2009 shows that over 75% of recorded mortalities were green turtles. The mean, minimum and maximum curved carapace length (CCL) was 67.6cm (SD +/- 24.4), 18cm and 148cm respectively. More than 60% had a CCL measuring less than 80cm, which is less than the average green turtle CCL at sexual maturity (80 – 110cm). This suggests that Tanzanian waters pose a significant threat to juvenile green turtles.

Most of the strandings are green turtles, but hawksbill, loggerhead and olive ridley are also occasionally recorded (St John & Muir, 2006). Many carcasses have head wounds caused by release from fishing nets and many show evidence of net damage around the neck and flippers suggesting incidental capture in gillnets rather than prawn trawlers or other fishing gears.

Temeke District, south of Dar es Salaam has the highest recorded rate of turtle mortalities in Tanzania with an average of 195 dead turtles stranded along a 60km stretch of coast annually. The area is a key breeding and nesting site for green turtles and hence there are a high number of turtles in inshore waters exposed to harmful fishing gears.

c) Anchored Fish Aggregating Devices (FADs):**d) Purse seine (with or without FADs):** YES NO

A Marine Fisheries Frame Survey undertaken by the Ministry of Livestock and Fisheries Development (mainland) and Ministry of Agriculture, Livestock and Environment (Zanzibar) in 2007 reported 578 purse seines operating in Tanzanian waters.

There is no data available regarding the level of interaction between sea turtles and these fishing gears in Tanzanian waters or the potential impact on sea turtle survival.

e) Longline (shallow or deepset): YES NO

A Marine Fisheries Frame Survey undertaken by the Ministry of Livestock and Fisheries Development (mainland) and Ministry of Agriculture, Livestock and Environment (Zanzibar) in 2007 reported 2,975 long liners operating in Tanzanian waters.

There is no data available regarding the level of interaction between sea turtles and these fishing gears in Tanzanian waters or the potential impact on sea turtle survival.

f) Driftnet: YES NO

g) Other1:

In Tanzania, potential fish production from territorial waters is estimated at 100,000 metric tons a year (MNRT, 2005). The fishery is dominated by artisanal fishers operating in the territorial waters and contributes significantly to employment of the coastal population of Tanzania.

The artisanal fishing industry has grown significantly in recent years. Between 2001 and 2005, the number of fishers increased by 56% from 19,071 to 29,754 with a concurrent increase in the number of fishing vessels from 4,927 to 7,190 (50%) (MNRT, 2005). 239 permanent landing sites were recorded in 13 coastal districts in 2005. 48% of fishers are distributed in Dar es Salaam and Coast Regions which boast the best fishing grounds in Tanzania.

The main artisanal gears are: gillnets, shark nets, long lines, hand lines, traps, ring nets and scoop nets. Catches are composed mainly of: sardines, anchovies, mackerel, kingfish, emperor, grouper, snapper, sharks, rays, shrimp, lobster and sea cucumber. The number of artisanal gears has increased significantly in recent years including gillnets. 36,359 gill nets were reported to be in use in 2007 (Sobo et al, 2008).

During a survey of artisanal fishers in 2007, 49 (18%) respondents reported catching turtles in their nets (Muir & Ngatunga, 2007). Of these, 45 (92%) were gillnet fishers, mostly using the smaller 5-6 inch mesh net. Of the others, three used hand lines and one a ring net. Most (n: 23) reported captures were of green turtles. Hawksbill, loggerhead and olive ridley species were also mentioned but leatherbacks were not. Most fishers (n: 36; 73%) reported that when they catch a turtle in their net they release it unharmed. Only ten admitted to killing and eating / selling turtles they captured and one said he would report any capture to the local Fisheries Officer.

All the respondents reported that they catch on average between one and ten turtles a year, during both the hotter calmer months of the NE monsoon (November to March) and the cooler months of the SE monsoon (July – Sept). Only eight respondents claimed to catch more than ten turtles in a year.

Alternative fishing gear includes spears and spear guns. The number of spear guns (and snorkelling gear) in use has increased in recent years due to a programme by IFAD enabling fisherman to purchase fishing gear on credit (Thiagarajan 1991; Slade 2000). This is thought to be responsible for increases in turtle catches (Clark and Khatib 1993; Slade 2000).

h) Other2:

None of the above

1.4.2 Please indicate the relative level of fishing effort and perceived impact of each of the above fisheries on marine turtles (e.g. in terms of by-catch). [TSH]

a) Shrimp trawls

Fishing effort:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Perceived Impact:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Source: Commercial trawling started in Tanzania in the late 1960s and 22 vessels formerly operated along the coast in 3 zones. The prawn trawling season was open for 9 months of the year between March and November (inclusive) (Richmond et al., 2002). Apart from several exclusion areas in Tanga region, trawling was unrestricted. Prawn

hotspots exist at Mchungu and Jaja off the Rufiji delta and in former times when good prawn concentrations were found, a maximum of 14 vessels might be fishing this area.

[Significant changes have taken place in the prawn trawl industry since 2002, which have yet to be reflected in this section of the report.]

16 turtles (green, hawksbill and loggerhead) were caught during a bycatch survey conducted in 2007 in the industrial prawn trawl fishery. All but one was alive (Muir 2007b). From this survey it is estimated that on average 76.4 turtles are caught each year with a fleet of 16 vessels (Muir and Ngatunga, in prep).

b) Set gill nets

Fishing effort:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Perceived Impact:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Source: Gillnets pose a major threat to all species of turtles (adult and subadult) in Tanzania. Most captures are incidental (Muir 2005b). However, at some key known foraging grounds, nets are set deliberately to catch turtles. Such sites include Ras Fikirini (west Mafia); Matanango and Nanano reefs off Msimbati in MBREMP; and Kimbiji (Temeke district).

The problem of incidental capture in nets has been well documented for the Mafia Island gillnet fishery where in the 1990s annual capture rates were estimated to be approximately 200 per year (Horrill and Ngoile 1991; Darwall 1996). More recent estimates for the whole Mafia area suggest annual capture rates of between 1,000 and 2,000 turtles. In Songo Songo, 30 turtles (green, hawksbill and loggerhead) were caught on 76 fishing trips recorded during a catch monitoring survey by Frontier in 1996 (Darwall 1996b). Assuming that the capture rate remains fairly constant throughout the year, an extrapolation of catch rates for Songo Songo for all jarife fishing boats was estimated in the mid-1990s to be in excess of 810 turtles per year.

A survey of turtle by-catch in gillnets in Mtwara in 1996 indicated that turtles are caught in a third of all fishing trips (Darwall et al. 2000) and in 2003, fishers from Mtwara reported that the average number of turtles caught accidentally in nets ranged from 2-3 per month in Mnazi Bay to as many as 2-3 per day at Litikoto (Muir 2003). Many turtles were also said to be caught during fishing forays to northern Mozambique for sale in Mtwara town. Gillnet fishers interviewed from Pombwe (Rufiji) and Somanga Ngolwe (Kilwa) stated that they occasionally catch 10 turtles a day, notably in the seagrass beds in Mohoro Bay, but the average daily figure is 2-5. In October 2003, 5 fresh turtle carcasses were observed at Somanga Ngolwe which gillnet fishers admitted were caught in their nets. Frontier conducted a 4 days survey on incidental turtle catch around Simaya Island in 1996 during which 10 turtles were captured in gillnets. Of these, 5 were drowned, two were sold and three were released (Darwall 1996). In Mafia, a turtle catch monitoring programme was initiated by Sea Sense in April 2004 in Mafia Island Marine Park. The information gathered to date indicates that turtles are caught on 45 - 60% of fishing trips by gillnet fishers in and around Chole bay on the east side of the island (Muir 2004.) These preliminary results confirm that gillnets, particularly bottom set nets, pose a significant threat to turtles.

Turtle carcasses washed up on Tanzania's beaches along the coast south of Dar es Salaam are reported regularly by local fishers and tourists. Beach monitoring by Sea Sense in 6 coastal districts indicates that between 150 and 200 turtles are stranded annually (Muir 2007). However, in some years numbers can be significantly higher. For example, between July and November 2004, 105 turtle carcasses were recorded washed up on Buyuni (Temeke) alone. Local fishers report that mortalities are caused by incidental capture in both gillnets and commercial prawn trawlers. The relative threat of gillnet and trawler fishing gears is unknown, but these studies suggest that gillnetting poses the greater threat (Muir 2005b).

c) Anchored Fish Aggregating Devices (FADs)

Fishing effort:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Perceived Impact:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Source:

d) Purse seine (with or without FADs)**Fishing effort:**

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Perceived Impact:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Source:

e) Longline (shallow or deepset)**Fishing effort:**

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Perceived Impact:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Source:

f) Driftnet**Fishing effort:**

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Perceived Impact:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Source:

g) Other1 (from 1.4.1): Fishing using spear guns**Fishing effort:**

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Perceived Impact:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Source: Not certain what the effort or impact is.

h) Other2 (from 1.4.1):**Fishing effort:**

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Perceived Impact:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Source:

1.4.3 Describe any illegal fishing that is known to occur in or around the waters of your country that may impact marine turtles. Describe the measures being taken to deal with this problem and any difficulties encountered in this regard. [TSH]

Despite Tanzanian legislation, illegal fishing continues to be practiced along the coast. One particularly damaging activity, dynamite fishing, was curbed in the 1990s, through the efforts of the Tanzanian Navy, but has re-emerged in recent years (Muir 2005b; Muir 2007b). 466 dynamite blasts were recorded in the Temeke District between July and December 2007 (Muir 2007b).

Dynamite fishing is the practice of using dynamite, homemade bombs or other explosives to stun or kill schools of fish for easy collection. Each blast instantly kills all fish and most other living organisms within a 15-20m radius of the blast. It can be extremely destructive to the surrounding ecosystem, as the shockwaves destroy the underlying habitat (such as coral reefs) that supports the fish. It also produces tasteless fish and threatens stocks in a way traditional fishing does not as it does not discriminate on fish size or age. Furthermore, the frequently improvised nature of the explosives used means danger for the fishermen through accidents and injuries. The main areas this fishing is practiced include: Tanga, Pangani, Temeke, Mkuranga, Rufiji and Mafia.

The problem of dynamite fishing is being tackled by the Tanzania Ministry of Livestock and Fisheries, the British High Commission, World Wide Fund for Nature, IUCN - the World Conservation Union and Sea Sense through patrols /enforcement, an education campaign and publication of a dynamite fishing status report.

1.4.4 Which of the following methods are used by your country to minimise incidental capture/mortality of marine turtles in fishing activities? [IND]

a) **Appropriate handling** of incidentally caught turtles (e.g. resuscitation or release by fishers using equipment such as de-hooking, line cutting tools and scoop nets)

YES NO NOT APPLICABLE

Observers on the prawn trawl by-catch survey were trained in how to handle and resuscitate turtles caught in nets.

b) **Devices that allow the escape of marine turtles** (e.g. turtle excluder devices (TEDs) or other measures that are comparable in effectiveness)

YES NO NOT APPLICABLE

Turtle Excluder Devices (TEDs) are not mandatory under Tanzanian Fisheries Law. However there has been a number of meetings and workshops with a range of stakeholders to discuss issues surrounding the used of TEDS. TAFIRI is planning TED trials in 2010.

c) **Measures to avoid encirclement** of marine turtles in purse seine fisheries

YES NO NOT APPLICABLE

d) **Appropriate combinations** of hook design, type of bait, depth, gear specifications and fishing practices

YES NO NOT APPLICABLE

e) **Monitoring and recovery of fish aggregating devices** (FADs)

YES NO NOT APPLICABLE

f) **Net retention and recycling schemes**

YES NO NOT APPLICABLE

g) **Spatial and temporal control of fishing** (e.g. seasonal closures of fishing activities)

YES NO NOT APPLICABLE

h) **Effort management control**

YES NO NOT APPLICABLE

Other (list and explain):

None of the above

1.4.5 Which of the following programmes has your country developed - in consultation with the fishing industry and fisheries management organisations - to promote implementation of measures to minimise incidental capture and mortality of turtles in national waters and in the high seas? [IND]

Onboard observer programmes

YES NO NOT APPLICABLE

On the industrial prawn trawl fishery in 2007. Confirmation is needed of whether this programme continues.

Vessel monitoring systems

YES NO NOT APPLICABLE

Inspections (i.e. at sea, in port, at landing sites)

YES NO NOT APPLICABLE

Training programmes / workshops to educate fishers

YES NO NOT APPLICABLE

Sea Sense holds regular meetings in coastal villages to educate the local people on issues related to marine conservation (Muir 2007b).

Informative videos, brochures, printed guidelines etc.

YES NO NOT APPLICABLE

Other (list and explain):

YES NO NOT APPLICABLE

None of the above

1.4.6 Are the mitigation measures described in 1.4.4 and 1.4.5, periodically reviewed and evaluated for their efficacy? [SAP]

YES NO UNSURE

1.4.7 In your country, what types of data collection, research and development have been undertaken to support the reduction of marine turtle incidental catch (while taking into consideration the impact of various mitigation measures on other species)? [SAP]

In Mafia, a turtle catch monitoring programme was initiated by Sea Sense in April 2004 in Mafia Island Marine Park. The information gathered to date indicates that turtles are caught on 45-60% of fishing trips by gillnet fishers in and around Chole bay on the east side of the island (Muir 2004). These preliminary results confirm that gillnets, particularly bottom set nets, pose a significant threat to turtles.

In 2007, Sea Sense, in collaboration with the Tanzania Fisheries Research Institute and Duke University (USA), conducted a rapid gillnet by-catch study. The preliminary results suggest that over 600 turtles are caught in this fishery annually (Muir et al. in prep).

From June to August 2007 a survey of by-catch in the prawn trawl fishery was conducted by Sea Sense and TAFIRI. 16 turtles were caught in five vessels (Muir and Ngatunga, in prep).

Mortalities

Recording of sea turtle strandings commenced in 2004 in five coastal districts, implemented by Sea Sense. On average, 230 – 250 mortalities are recorded each year (West, 2010). Many dead turtles are washed up on beaches and show evidence of net entanglement. There is also a high incidence of turtle slaughter in Tanzania and discarded carapaces are often found close to villages or fisher camps. Based on carapace determination, most mortalities (79%) are attributed to green turtles. Hawksbill turtles represent 12% of all recorded mortalities, olive ridley, 4%, loggerhead, 2% and the remaining 3% are unidentified.

1.4.8 Has your country exchanged information and provided technical assistance (formally or informally) to other Signatory States to promote the activities described in 1.4.4, 1.4.5 and 1.4.7 above? [SAP]

YES NO UNSURE

1.4.9 What legislative and practical measures has your country taken in support of UN General Assembly Resolution 46/215 concerning the moratorium on the use of large-scale driftnets? [SAP]

1.5.1 Does your country have legislation to prohibit direct harvest and domestic trade in marine turtles, their eggs, parts and products; and to protect important turtle habitats? [IND]

YES NO UNSURE

In Tanzania, all species listed on Appendix I of CITES are officially protected. On the mainland, turtles fall under the responsibility of the Fisheries Division (Ministry of Natural Resources and Tourism).

In the draft Fisheries Regulations, 2005, made under section 57 of the Fisheries Act of 2003, section 12 (1) (9) states that no person shall kill or fish sea turtles or possess a sea turtle shell or deal in sea turtle shells or any other species listed as endangered in any International convention to which the United Republic is a party. In the case of a first offence, the fine is TSh 200,000 or a 3 month sentence, and in the case of a second and subsequent offence, the offender is fined TSh 300,000 or a 6 month sentence, or both.

Additional regulations relating directly or indirectly to marine turtles include: section 24 (2) which states that where a trawler has caught a live endangered species, the species shall be returned to the water immediately; section 22 (3) in which every fishing community in collaboration with the village government shall form Beach Management Units for the purpose of conserving fishery resources and the environment; and section 52 in which no person shall use for fishing a monofilament net in all fresh and marine water fisheries.

On Zanzibar, where marine turtles are also classified as "fish" and under the Fisheries Act of 1988, the Director has powers to make regulations on how, when and where and what species may be caught. Marine turtles are protected by the 1993 Fisheries Regulation which prohibits fishing of turtles as well as possession of hawksbill or any other species of "fish" that are considered endangered or threatened under international conventions or agreements. In addition to Fisheries legislation, the Marine Parks and Reserves Act No. 29 of 1994 provides for the establishment of marine protected areas and the protection and conservation of coastal and marine life including turtles.

1.5.2 Which, among the following list, are economic uses and cultural values of marine turtles in your country? Please rate the relative prevalence / importance of each consumptive or non-consumptive use.
[INF]

**USES /
VALUES**

**RELATIVE PREVALENCE /
IMPORTANCE**

Meat consumption

YES NO

HIGH MODERATE LOW UNKNOWN

Illegal slaughter of nesting females occurs frequently in many coastal districts (Sea Sense, *unpublished data*) but is likely to be opportunistic rather than direct hunting (Muir, 2005). However, staff at MBREMP report that fishers set nets in areas where they are sure of catching turtles using a net known locally as "likembe" which specifically targets turtles.

Many Tanzanians enjoy eating turtle meat although most are aware that killing sea turtles is illegal. Sea turtles are typically sold whole for between TSh 10,000 - 40,000 (US\$ 6-30) depending on size, or between TSh 500 - 1,000 per kilogram of meat. The sale of turtle meat has traditionally provided a valuable source of local income although some claim that they do not eat turtle meat because it is prohibited in the *Koran*. However, the status of turtles in Islamic religion appears to be a matter of personal interpretation as the meat and eggs are eaten by many Muslims, not only in Zanzibar, where Muslims comprise 95% of the population, but also in other predominately Islamic locations (eg Mafia) (Khatib et al., 1996).

Meat of the green turtle is most favoured, while that of hawksbill and loggerhead is often avoided as it is believed to be poisonous. During the survey in 2003, 60% of respondents from Pemba Island reported that turtle meat was no longer consumed. This was attributed mainly to an incident in March 1996 when two cases of poisoning through consumption of hawksbill turtle meat occurred, resulting in the death of 37 people (Slade et al., 1997). Deaths from turtle meat poisoning have also been reported from Kwale Island, Songo Songo Island and Kilwa, but the number of deaths has not been confirmed.

Sea turtles are reported to be caught daily in fishing nets and with hand lines. The turtles are brought in to the landing sites live for sale, normally early in the morning or late in the evening, to avoid detection. Turtle meat is sold regularly at the markets, particularly to Chinese buyers. The meat is believed to improve the immune system. Turtle scutes and oil and are also sold for medicinal purposes.

During the second survey in 2009, 39 interviews were held with traders who all admitted to knowing that sea turtles are protected. Trade is done in secret and is thought to be the result of the high level of sea turtle bycatch in fishing nets. Traders reported that fishers never release captured sea turtles but bring them to the market for slaughter and subsequent sale.

Egg consumption

YES NO

HIGH MODERATE LOW UNKNOWN

Nest poaching has occurred in Tanzania for generations. Turtle tracks left in the sand during nesting show clearly the location of the nest and the eggs are normally found using a sharpened stick. Evidence of egg collection has been observed along most of the Tanzanian coast (Sea Sense, *unpublished data*). During an interview survey with local communities in 2003, 84% (378) of respondents reported that turtle eggs are collected for domestic consumption and are only occasionally sold, either per egg (TSh 20 – 100) or per slice of omelette (TSh 50 – 100) (Muir, *unpublished data*). However, surveys at several fish markets in the Dar es Salaam area in 2008 and 2009 confirmed that the trade in sea turtle eggs does exist (West et al, 2009).

Shell products

YES NO

HIGH MODERATE LOW UNKNOWN

The trade in sea turtle products remains a significant threat to sea turtle survival in Tanzania. The rapid growth of tourism on Zanzibar in the early 1990's created a new souvenir market for turtle shells and turtle products such as jewellery, and may have encouraged hunting of them. Such souvenirs were sold in Zanzibar Stone Town and on the east coast of the island. The trade ceased following the collection and burning of 657 turtle products from curio shops in 1995 (Khatib et al., 1996). However, the curio trade in hawksbill products in Zanzibar has recently re-emerged (*pers.*

comms.)

During the first survey in 2008, 48 people were informally interviewed over a period of seven weeks. Sea turtle carapaces were found to be on sale at several markets in the Dar es Salaam area fetching between US\$3 – 12 depending on size. The shells are usually varnished and then sold for decoration to Tanzanians. Occasionally they are used as water containers for livestock. It is believed that livestock production will increase if animals drink water from a turtle carapace.

Fat consumption

YES NO

HIGH MODERATE LOW UNKNOWN

On Zanzibar, Clark & Khatib (1993) reported that many residents believe sea turtle products (meat, oil, eggs, shell, skin and internal organs) have medicinal properties and use them to treat a wide range of diseases. During the 2003 survey, 14% (63) of respondents mentioned uses for turtle oil, most commonly as a cooking fat (33%). In Tanga, oil is used mainly as a cure for earache and in Mtwara turtle oil is applied to the skin to heal burns and rashes. In other parts of Tanzania, oil is used to treat asthma, hernias and muscle ache and is occasionally used to waterproof traditional wooden dhows (Muir, *unpublished data*).

Following several unverified reports detailing the illegal trade in sea turtle products in the Dar es Salaam area, surveys were undertaken to assess the true status of this trade. Potential landing sites for turtle products were visited by undercover investigators in July and August 2008 and again in August 2009 (West et al, 2009).

Traditional medicine

YES NO

HIGH MODERATE LOW UNKNOWN

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Eco-tourism programmes

YES NO

HIGH MODERATE LOW UNKNOWN

Sea Sense has initiated eco-tourism activities in Temeke, Mafia and Pangani Districts. Tourists are encouraged to watch turtle hatchling events and adopt nests (Muir 2005b).

Cultural / traditional significance

YES NO

HIGH MODERATE LOW UNKNOWN

Current information on turtle uses and myths in Tanzania is based on questionnaire surveys conducted in Pemba and Unguja between 1995 and 1998 (Clark and Khatib, 1993; Slade et al. 1997; Khatib 1998), a national questionnaire survey (450 respondents) conducted between April and June 2003 by the TTDCP (Muir unpublished data) and direct observations.

Other

1.5.3 Please indicate the relative level and impact of traditional harvest on marine turtles and their eggs.
[\[IND, TSH\]](#)

Level of harvest:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Impact of harvest:

RELATIVELY HIGH MODERATE RELATIVELY LOW NONE UNKNOWN

Source of information:

Egg collection and hunting of nesting females for meat have been considered by some as two of the main threats to sea turtles (Clark and Khatib 1993; Slade 2000).

1.5.4 Have any [domestic](#) management programmes been established to limit the levels of intentional harvest? [\[SAP\]](#)

YES NO UNKNOWN

On Zanzibar and mainland Tanzania, involvement of local communities in nest protection, monitoring, data collection and awareness raising has played a key role in reducing threats to turtles (Muir 2005b). The provision of financial incentives is a conservation option, and is practiced in some areas in the region. There are of course dangers associated with incentive-driven conservation, the most important of which is financial sustainability. However, in areas where mortality (through turtle and egg poaching) has reached critical levels, financial rewards may be the only realistic short-term solution. In the longer term it may be possible to generate revenue to fund turtle conservation through turtle tourism and park entry fees.

On Zanzibar, cash incentives have been found to be counter-productive to obtaining committed public participation (Khatib et al. 1996). However, in Mafia and Mtwara modest incentives, averaging US\$7 and US\$3 per nest respectively, have proven highly effective in involving local communities and in protecting nests.

1.5.5 Describe any management agreements negotiated [between your country and other States](#) in relation to sustainable levels of traditional harvest, to ensure that such harvest does not undermine conservation efforts. [\[BPR\]](#)

1.6.1 First, select one of the options at left to indicate whether or not your country has any of the following measures in place to minimise the mortality of eggs, hatchlings and nesting females. If yes, then estimate the relative effectiveness of these measures. [\[IND, SAP\]](#)

MEASURES

RELATIVE EFFECTIVENESS

Monitoring/protection programmes

YES NO N/A

EXCELLENT GOOD LOW UNKNOWN

In January 2001, a community-based turtle and dugong conservation initiative was established in Mafia district (Mafia Island) by a Tanzanian NGO now called Sea Sense to promote the long-term survival of turtles and dugongs, and their related habitats, in collaboration with Mafia District Council, Mafia Island Marine Park and local communities. This featured a long term sea turtle nest monitoring programme. Direct conservation, monitoring, tagging, public awareness, training and research are undertaken by a team of 8 village-elected "turtle monitors". Beach surveys were undertaken and interviews were held with local fishers to help identify turtle nesting beaches (Muir & Abdallah, 2001). Since then, six community members have been conducting early morning foot patrols throughout the year, at five key nesting beaches. Data is collected on nesting species, nest location and frequency of nesting activity. Nests are located and identified by day track counts. Threats to nesting females and incubating eggs are also recorded and any nest under threat from poaching, predation or tidal inundation is translocated to a safer area. All nests are monitored until hatching and then excavated to assess hatching success. Standard protocols are used for all monitoring and protection techniques as described in Eckert et al., 1999.

A nest protection incentive scheme was initiated in 2002. Under this scheme, individuals who report a nest receive an

initial reward of USD\$3 once the nest is verified. They assist the turtle monitor in protecting the nest from human and non-human predators during the incubation period and are rewarded with a second payment of USD 0.40 for every successful hatchling and USD 0.20 for every rotten egg. In 2003, Sea Sense started monitored nesting activity on the mainland coast in Temeke district for 12 months, specifically at Yale Yale Puna village where turtles were reported to be nesting. Also in 2003 (April - June) Sea Sense conducted a national questionnaire survey (450 respondents) to determine the status, distribution, uses and threats to turtles in Tanzania. These data are as yet unpublished.

In May 2004, the scope of the programme (monitoring of turtle nesting beaches) was scaled up to include the entire mainland coast of Tanzania, using Mafia as a successful working model. Sea Sense has now initiated community-based turtle conservation and monitoring activities in 5 coastal districts - Pangani, Bagamoyo (including Madete beach), Temeke, Mkuranga, Rufiji, Kilwa and Mafia. was scaled up in 2004. Monitoring protocols used in Mafia Island since 2001 are now being implemented in eight coastal districts (approximately one-third of the Tanzanian coastline). Data is being collected by a network of 45 community Conservation Officers throughout the year. A total of 2,135 turtle nests have been identified and monitored since the implementation of the Sea Sense nest monitoring programme in 2001. 1,741 (82%) have been successfully protected and 146,713 hatchlings have reached the sea. Clutch size and hatching success rates have been calculated according to Miller, 1999. Mean clutch size for green turtles was 117 (+/- 25). Mean clutch size for hawksbills was greater at 143 (+/- 24). A mean hatching success rate of 67% (+/- 29) was recorded for green turtles and 73% (+/- 25) for hawksbill turtles.

In addition, opportunistic day and night patrols have been undertaken to nearby islands in the Mafia archipelago where turtle nesting has been reported by local fishers. Results indicate that Shungi-mbili is an important nesting site, particularly for critically endangered hawksbill turtles (Muir & Abdallah, 2002). However, seasonal fisher camps on the island have disturbed nesting females and those that do come ashore to nest are either slaughtered, or their eggs are poached (Muir & Abdallah, 2002).

The Marine Parks and Reserves Unit (Ministry of Livestock and Fisheries) has been monitoring turtle nesting activity in the Dar es Salaam Marine Reserves of Bongoyo, Mbudya and Pangavini islands with the help of Honorary Wardens since 2002 and training by Sea Sense. In April 2004, a turtle monitoring and conservation programme was established by the Mnazi Bay - Ruvuma Estuary Marine Park (MBREMP) in Mtwara District using experiences from Mafia. Four locally elected villagers assist with patrols, data collection and awareness raising. A single incentive of US\$3 is given to individuals who report a nest. Beach patrols have contributed greatly to the reduction in nest raiding by poachers (Muir 2005b). Under this programme, turtle nesting sites are managed in collaboration with local communities. Data is collected on nesting activity and incidences of turtle slaughter and mortality.

A green turtle nest monitoring programme was established in Mnemba Island on the north east coast of Zanzibar in 2001. The programme is run by hotel staff who manage a high end lodge on the island. Security staff patrol the beaches each night and monitor turtle nesting activity. Morphometric data is collected from nesting females together with data on incubation periods and hatchling success rates. Any nesting female encountered during night patrols is tagged with a titanium flipper tag.

Education/awareness programmes

YES NO N/A

EXCELLENT GOOD LOW UNKNOWN

Since 2001, Sea Sense has conducted education / awareness programmes including annual primary and secondary school competitions (trash art, painting, poetry, theatre, song) as well as regular village meetings and training activities (Muir 2005b; Muir 2007b). Effective awareness campaigns / educational outreaches are thought to have helped in reducing the levels of nest poaching.

Egg relocation/hatcheries

YES NO N/A

EXCELLENT GOOD LOW UNKNOWN

Sea Sense has trained Conservation Officers who relocate nests when they are at risk from predation or inundation by the high tide (St John and Muir 2006; Muir 2007a; Muir 2007b).

Predator control

YES NO N/A

EXCELLENT GOOD LOW UNKNOWN

Natural predators such as monitor lizards (*Varanus spp*), mongoose (*Herpestes javanicus*), honey badgers (*Mellivora capensis*), termites (*Isoptera*) and feral dogs (*Canis spp*) pose a significant threat to incubating turtle eggs. Ghost crabs (*Ocypode spp*), Indian house crows (*Corvus splendens*) and other birds prey on hatchlings as they emerge from the nest. Nests are also predated by sea otters and red ants.

Measures by Sea Sense to control predation include: hiding the nest; placing wire mesh on the nest; placing cold ash at the bottom and top of the nest. Many nests, particularly in Temeke District, have been fully or partly predated by red ant infestations. Ash does not seem to have been effective (Muir 2007a; Muir 2007b).

Vehicle / access restrictions

YES NO N/A EXCELLENT GOOD LOW UNKNOWN

Vehicles have been banned from Msimbati beach in Mtwara which is a turtle nesting site.

Removal of debris / clean-up

YES NO N/A EXCELLENT GOOD LOW UNKNOWN

During World Environment Day events, beach clean ups, initiated by the Tanzania Coastal and Marine Forum, have been performed - e.g. Mafia, Dar es Salaam and the Kilwa District (Muir 2007a).

Re-vegetation of frontal dunes

YES NO N/A EXCELLENT GOOD LOW UNKNOWN

The threat of erosion is illustrated by the case of Maziwe Island which submerged in the 1980s, and in Zanzibar, a study commissioned by the Department of Environment, indicates that the coastline is being eroded at a rate of 1-3 meters a year. The areas most threatened in Unguja include Nungwi, Bwejuu, Jambiani and Mnemba Island (Khatib 1998). Since 2001, the island of Shungi-mbili has been severely eroded, partly from natural causes and partly due to felling of vegetation by fishermen to supply firewood and to cure sea cucumbers. This has led to the creation of very steep beach walls which turtles have difficulty climbing to nest, and an increase in the general level of activity on the island with reduced space available for fishers to camp. This has resulted in a reduction in the number of turtles that nest on Shungi-mbili Island, and those that do, typically lay their eggs below the sand wall where the eggs are inundated (Muir 2005b).

Building location/design regulations

YES NO N/A EXCELLENT GOOD LOW UNKNOWN

Disturbance of nesting beaches from tourism development is a major concern for sea turtle populations in Zanzibar (Bourjea et al., 2008). There has been a massive increase in tourism in Zanzibar since the early 1990's (Slade, 2000). The Zanzibar Tourism Development Plan (UNDP 1983) reported only 10 unclassified accommodation units with 215 rooms and 467 beds. By 1990 there were 45 hotels providing a total of 548 rooms and 1063 beds. By the year 2000 there were 157 accommodation units with 5224 beds. This represents a 1,120% increase in number of beds since 1983 and the number is still increasing. Many hotels have been built on former nesting beaches and as a result there has been a marked decline in turtle nesting in those areas (Whitney et al, 2003). Kiwengwa beach on the northeast coast of Unguja, an important turtle nesting beach, has been rendered totally unsuitable for nesting turtles as a direct result of hotel development. Natural beach vegetation has been cleared in many areas and beachfront shops and restaurants have been built. Tanzanian law requiring a 60m set back limit from the high spring tide mark is seldom enforced and plans for sensitive beach lighting are rarely incorporated into mitigation measures. Disturbance from tourism is less of an issue along the mainland coast where the industry is less developed.

Light pollution reduction

YES NO N/A EXCELLENT GOOD LOW UNKNOWN

Other (list and rate them)

YES NO N/A

Genetic stock assessment

Tanzania contributed 40 green turtle DNA samples (taken between 2003 and 2006) to a study of green turtle genetics in the South West Indian Ocean, conducted in collaboration with IFREMER. Results from this study were written up as part of a PhD thesis (Taquet, 2007).

1.6.2 Has your country undertaken any evaluation of its nest and beach management programmes?

[SAP]

YES NO NOT APPLICABLE

OBJECTIVE II. PROTECT, CONSERVE AND REHABILITATE MARINE TURTLE HABITATS**2.1.1 What is being done to protect critical habitats *outside* of established protected areas? (NB: It is assumed that legislation relating to established protected areas will have been described in Section 1.5.1) [BPR, SAP]**

Tanzania mainland and Zanzibar have 10 marine protected areas (MPAs) together with the Tanga Collaborative Fishery Management Areas which although not officially gazetted are actively managed. These are: Mafia Island Marine Park (MIMP), Mnazi Bay-Ruvuma Estuary Marine Park (MBREMP), Maziwe Island Marine Reserve, Dar es Salaam Marine Reserves, Menai Bay Conservation Area, Chumbe Reef Sanctuary, Misali Island Conservation Area, Mnemba Island Conservation Area, Kiwengwa Controlled Area and Jozani -Chwaka Bay National Park.

2.1.2 Are assessments routinely made of the environmental impact of marine and coastal development on marine turtles and their habitats? [IND, SAP]

YES NO NOT APPLICABLE

Habitat destruction caused by erosion, in some cases the result of coastal developments, live coral mining, destructive prawn trawling practices, and clearing of mangroves are also threatening sea turtles (Khatib 1998; Muir 2007b). Natural beach erosion and accretion can lead to turtles experiencing difficulties nesting and eggs can be uncovered, inundated or swept away (Witherington, 1999).

The threat of erosion is illustrated by the case of Maziwe Island which submerged in the 1980s, and in Zanzibar, a study commissioned by the Department of Environment, indicates that the coastline is being eroded at a rate of 1-3 meters a year. The areas most threatened in Unguja include Nungwi, Bwejuu, Jambiani and Mnemba Island (Khatib, 1998). Since 2001, the island of Shungi-mbili has been severely eroded, partly from natural causes and partly due to felling of vegetation by fishermen to supply firewood and to cure sea cucumbers. This has led to the creation of very steep beach walls which turtles have difficulty climbing to nest, and an increase in the general level of activity on the island with reduced space available for fishers to camp. This has resulted in a reduction in the number of turtles that nest on Shungi-mbili Island, and those that do, typically lay their eggs below the sand wall where the eggs are inundated.

2.1.3 Is marine water quality (including marine debris) monitored near turtle habitats? If yes, describe the nature of this monitoring and any remedial measures that may have been taken. [SAP]

YES NO NOT APPLICABLE

Mmochi and Mberek (1998)* specifically investigated trends in agricultural pesticide use in Zanzibar, for the period 1977 to 1988. Zanzibar is set on reducing the use of pesticides in agriculture, and this study demonstrated a decrease in toxicity of chemicals being used (Mmochi and Mberek 1998). Mohammed (2002)** reviewed previous water quality studies conducted in Tanzania; it was concluded that water pollution in Tanzania has not yet reached critical levels. However, water quality assessments are not conducted routinely. Pollution from sewage discharge, development and industry, and macrodebris (such as plastics) in the water and on nesting beaches have been identified as potentially

important threats to sea turtles in Tanzania (Slade 2000; Muir 2005b).

*Mmochi, J., Mberek, R.S. 1998. Trends in the types, amounts and toxicity of pesticide use in Tanzania: Efforts to control pesticide pollution in Zanzibar, Tanzania. *Ambio* 27(8): 669 - 676.

** Mohammed, S.M. 2002. A review of water quality and pollution studies in Tanzania. *Ambio* 31(7/8): 617 - 620.

2.1.4 Are measures in place to prohibit the use of poisonous chemicals and explosives? [SAP]

YES NO NOT APPLICABLE

The practice of dynamite fishing is being tackled by the Tanzania Ministry of Livestock and Fisheries, the British High Commission, World Wide Fund for Nature, IUCN - the World Conservation Union and Sea Sense through patrols / enforcement, an education campaign and publication of a dynamite fishing status report.

2.2.1 Are efforts being made to recover degraded coral reefs? If yes, give details (location, duration, effectiveness, lessons learned, future plans etc). [IND, SAP]

YES NO NOT APPLICABLE (no degraded coral reefs)

On mainland Tanzania, several important turtle nesting beaches and seagrass and coral reef habitats are included in marine protected areas (Muir 2005b).

2.2.2 Are efforts being made to recover degraded mangrove habitats that are important for turtles? If yes, give details (location, duration, effectiveness, lessons learned, future plans etc.) [IND, SAP]

YES NO NOT APPLICABLE (no mangrove habitats important for turtles)

Tanzania has prepared a National Mangrove Management Plan (1991), which allows for degraded mangrove forests to be closed to facilitate recovery (Semesi 1992*). However, this management plan is still not followed closely (Semesi 1998**). One of the constraints in implementing the management plan is a lack of trained personnel. Many mangrove forests are included in marine protected areas (Muir 2005b).

* Semesi, A.K. 1992. Developing management plans for the mangrove forest reserves of mainland Tanzania. *Hydrobiologia* 247, 1-10.

**Semesi, A.K. 1998. Mangrove Management and Utilization in Eastern Africa. *Ambio* 27(8):620-626.

2.2.3 Are efforts being made to recover degraded sea grass habitats? If yes, give details (location, duration, effectiveness, lessons learned, future plans etc.). [IND, SAP]

YES NO NOT APPLICABLE (no degraded sea grass habitats)

On mainland Tanzania, several important turtle nesting beaches and seagrass and coral reef habitats are included in marine protected areas. These include: Chole Bay, Juani, Kungwi, Baleni and Ras Kisimani in MIMP; Msimbati, Litokoto and Kingumi in MBREMP; and Mbudya, Bongoyo and Maziwe Island Marine Reserves. Madete beach has been included in the boundaries of Saadani proposed National Park.

On Zanzibar, Kiwengwa Controlled Area (Unguja) was established because of its nesting turtle population although no recent nests have been recorded probably because of the extensive hotel development. Mnemba Island Marine Conservation Area (MIMCA), a partnership between local communities, tourism operators and the government, was created in 2003, and supports an important green turtle nesting population, as does Misali Island Conservation Area in Pemba.

Another increasingly popular approach to the protection and sustainable management of coastal is integrated coastal zone management which provides a framework within which many different sectors can work together and plan for multiple use of coastal areas, developing marine protected area networks, promoting environmental education, identifying needs for legislation and policies and conducting research and monitoring programmes (Gibson and Smith 1999).

OBJECTIVE III. IMPROVE UNDERSTANDING OF MARINE TURTLE ECOLOGY AND POPULATIONS THROUGH RESEARCH, MONITORING AND INFORMATION EXCHANGE

3.1.1 Give a list of available literature that includes baseline information from studies carried out in your country on marine turtle populations and their habitats. [INF]

- Adams, M.A., Khatib, A.A. 1996. Sea turtle conservation on Zanzibar: A comparative survey of - community perspectives. 1-41 p.
- Clark, F. 1992. Pemba sea turtle survey: Report on pre-survey training workshop for village contacts.
- Clark, F., Khatib, A.A. 1993. Sea turtles in Zanzibar: Status, distribution, management options and local perspectives. Zanzibar Environmental Study Series No. 15b. 1-84 p.
- Clark, F., Khatib, A.A. 1993. Sea turtles in Zanzibar - a preliminary study. 1-35 p.
- Cowper, D., Darwall, W.R. 1996. Sea turtles of the Songo Songo Islands. *Miombo* 15: 14-15.
- Darwall, W.R.T., Choiseul, V.M. 1996. Marine biological and marine resource use surveys in the Songo Songo Archipelago, Tanzania. No. 4: Okuza Island.
- Darwall, W.R.T. 1996. Marine biological and marine resource use surveys in the Songo Songo Archipelago, Tanzania. No. 3: Simaya Island.
- Eastern African Marine Ecoregion Programme 2004. The Eastern African Marine Ecoregion Conservation Plan 2005-2009. 1-62 p.
- Francis, J., Bryceson, I. 2000. Tanzanian coastal and marine resources: Some examples illustrating questions of sustainable use. 76-102 p. In *Lessons learned: Case studies in sustainable use*.
- Frazier J & Rodgers, WA. 1974. Marine turtles in Tanzania. Unpublished.
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- Frazier, J. 1980. Exploitation of marine turtles in the Indian Ocean. *Human Ecology*: 8 (4) 329-369.
- Frazier, J.G. 1993. Dry coastal ecosystems of Kenya and Tanzania. 129-150 p. In: Van der Maarel, E. (Ed.), *Dry Coastal Ecosystems: Africa, America, Asia and Oceania. Ecosystems of the World*. Elsevier, New York.
- Gove, D, Pacule, H & Goncalves, M. 2001. The impact of Sofala Bank (Central Mozambique) shallow water shrimp fishery on marine turtles and the effects of introducing TEDs on the shrimp fishery. WWF. 23 pp
- Guard, M., Muller, C., Evans, D. 1998. Marine biological and resource use surveys in Mtwara District, Tanzania. Comparative summary report of fringing and coral reefs within and adjacent to Mnazi Bay. Report No. 1. The Society for Environmental Exploration and the University of Dar es Salaam.
- Hiebler, J.A., Wong, M.J., Khatib, A.A., Mohammed, S.M. 1997. Sea turtle conservation: Public awareness and captive environments. 1-33 p.
- Howell, K.M. 1993. A review of the conservation status of sea turtles in Tanzania.
- Howell, K.M., Mbindo, C. 1996. The status of sea turtle conservation in Tanzania. 73-80 p. In: Humphrey, S., Salm, R.V. (Eds.), *Status of sea turtle conservation in the Western Indian Ocean*. IUCN/UNEP, Nairobi, Kenya.
- Hughes, GR. 1995. Conservation of sea turtles in the Southern Africa region. In: K A Bjorndal (Ed), *Biology and Conservation of Sea Turtles*, Revised Edition. Smithsonian Institution Press, Washington DC. 619 pp.
- KESCOM. 1996. Sea turtle recovery action plan for Kenya. Prepared by Kenya Sea Turtle Conservation Committee (KESCOM). Kenya Wildlife Service Technical Series No. 3.
- Khatib, AA, Khiari, SK & Mbindo, C. 1996. The status of sea turtle conservation in Zanzibar. In: IUCN/UNEP. Humphrey SL & Salm RV (eds.): *Status of sea turtle conservation in the Western Indian Ocean*. Regional Seas Reports and Studies.
- Khatib, A.A. 1998. Sea turtles nest recording program: Unguja Island. *Ambio* 27: 763-764.
- Khatib, A.A. 1998. The turtle nesting programme: Unguja Island report 1997-1998. 1-21 p.

- Khatib, A.A., Nassor, M.S. 2006. Assessing the importance of sea turtle mortality due to fisheries. Lugendo, BR, Mgaya, YD & Semesi, AK. 1997. The seagrass and associated macroalgae at selected beaches along Dar es Salaam coast.
- Mack, D, Duplaix, N & Wells, S. 1995. Sea turtles, animals of divisible parts: international trade in sea turtle products. In: K A Bjorndal (Ed), *Biology and Conservation of Sea Turtles*, Revised Edition. Smithsonian Institution Press, Washington DC. 619 pp.
- Mahenge, J. 2004. Quarterly activity report: Mnazi Bay-Ruvuma Estuary Marine Park.
- Muir, C.E. 2003. An Assessment of the status of turtles, dugongs and cetaceans in Mnazi Bay-Ruvuma Estuary Marine Park & recommendations for a conservation strategy. Report to IUCN / MBREMP Project.
- Muir, C.E. 2004a. Community-based marine turtle conservation in Tanzania. 5-6 p.
- Muir, C.E. 2004b. Mafia turtle and dugong conservation programme: Tanzania. Results FY04 (01 July 2003 - 30 June 2004). 1 pp.
- Muir, C.E. 2004c. Tanzania Turtle & Dugong Conservation & Research Programme - quarterly progress report. Submitted to Commission for Science & Technology, Dar es Salaam.
- Muir, C.E. 2005a. Tanzania turtle and dugong conservation programme: Progress report January - June 2005. 1 pp.
- Muir, C.E. 2005b. The status of marine turtles in the United Republic of Tanzania, East Africa. Sea Sense Report (Tanzania Turtle and Dugong Conservation Programme).
- Muir, C.E. 2005c. The status of marine turtles in the United Republic of Tanzania. 12-13 p. In: Humphrey, S.L., Wilson, A. (Eds.), *Marine turtle update: Recent news from the WWF Africa and Madagascar marine turtle programme*.
- Muir, C.E. 2006. The relative importance of sea turtle mortality due to fisheries in Tanzania.
- Muir, C.E. 2007a. Sea Sense Technical Report: June 2007. 1-9 p.
- Muir, C.E. 2007b. Community-based endangered marine species conservation: Tanzania.
- Muir, C.E., Abdallah, O. 2003. Tanzania Turtle and Dugong Conservation and Research Programme: Annual progress report.
- Mortimer, J.A., Donnelly, M. 2007. Marine turtle specialist group 2007 red list status assessment: Hawksbill turtle (*Eretmochelys imbricata*). 1-121 p.
- Muir, C.E & Ngatunga, BP. 2007. Rapid Gillnet Bycatch Survey - United Republic of Tanzania. In prep.
- Ngusaru, A., Tobey, J., Luhikula, G. 2001. Tanzania state of the coast 2001: People and the environment. Ochieng, C.A. & Erfteimeijer, P.L.A. 2002. The status of seagrass ecosystems in Kenya and Tanzania. University of Dar es Salaam. 39pp.
- O'Grady, G & Muhidini, M. 2003. Green turtle monitoring at Mnemba. *Ecological Journal*, Volume 5. Conservation Corporation Africa.
- Pharaoh, A.M., Fanning, E., Said, A. 2003. Observations of sea turtles nesting on Misali Island, Pemba. *Journal of East African Natural History* 92: 127-134.
- Richmond, M.D. (ed.). 1997. A guide to the Sea Shores of Eastern Africa and the Western Indian Ocean Islands. Sida Department for Research Cooperation, SAREC, 448pp.
- Richmond, M. D., Wilson, J., Mgaya, Y. & le Vay, L., 2002. An analysis of small holder opportunities in fisheries, coastal and related enterprises in the floodplain and delta areas of the Rufiji River, Tanzania. REMP Technical Report No. 25.
- Semesi, A.K., Mgaya, Y., Muruke, M.H.S., Francis, J., Mtolera, M., Msumi, G. 1998. Coastal resources utilisation issues in Bagamoyo, Tanzania. *Ambio* 27: 635-644.
- Slade, L, Khatib, AA & Yussuf MH. 1997. Sea turtles in Zanzibar: Pemba sea turtle conservation education and community nest recording programme - November 1995 - March 1997. Department of Environment, Zanzibar.
- Slade, L. 2000. Sea turtle recovery action plan for Zanzibar. 1-91 p.
- St John, F., Muir, C.E. 2006. Sea Sense Annual Report: July 2005 - June 2006. 1-14 p.

Tanzania Coastal Management Partnership. 2003. Tanzania: State of the coast: The national ICM strategy and prospects for poverty reduction.

Thiagarajan, T. 1991. Status of sea turtles in Zanzibar. 1-12 p.

Troeng, S. & Drews, C. 2004. Money talks: economic aspects of marine turtle use and conservation. WWF-International, Gland, Switzerland UNEP, 2001. Eastern Africa Atlas of Coastal Resources: Tanzania. Nairobi, Kenya.

United Republic of Tanzania, 2003. National Integrated Environment Management Strategy. Vice President's Office, Dar es Salaam.

Wang, YQ, Ngusaru, A, Tobey, J, Makota, V, Bonyngge, G, Nugranad, J, Traber, M & Bowen, R. 2003. Remote sensing of mangrove change along the Tanzania coast. *Marine Geodesy*, 26(1-2): 1-14.

Wamukoya, G.M. and Salm, R. V. 1998. Report of the Western Indian Ocean turtle excluder device (TED) training workshop. 1-36 p.

3.1.2 Have long-term monitoring programmes (i.e. of at least 10 years duration) been initiated or planned for priority marine turtle populations frequenting the territory of your country? [IND, BPR]

YES NO UNSURE

Sea Sense, a Tanzanian NGO, has been monitoring and protecting marine turtles in mainland Tanzania since 2001 and plans to continue monitoring for at least a total period of 10 years (Muir 2004a; Muir 2005b).

Turtle nesting sites in Mafia and Temeke Districts have been identified for long term monitoring. These locations are the two most important sea turtle nesting sites on the Tanzanian mainland. In addition, large data sets already exist for turtle nesting and mortality in these two districts so there is considerable potential to build on existing initiatives.

Mnemba and Pemba Islands in the Zanzibar archipelago should also be included in a long term monitoring programme as these are significant offshore nesting sites that support populations of both green and hawksbill turtles.

Populations in Mtwara should be included in a monitoring programme as important foraging grounds have been reported in that area and tag returns other countries in the region have been collected here suggesting that the area supports important foraging populations that may nest elsewhere in the region.

3.1.3 Has the genetic identity of marine turtle populations in your country been characterised? [INF, PRI]

YES NO UNSURE

Currently genetic studies are being conducted in the Mafia, Temeka, Mtwara (Mnazi-Bay-Ruvuma Estuary Marine Park, MBREMP) and Bagamoyo Districts (Muir 2005b; St John and Muir 2006).

Genetic stock assessment was carried out for nesting populations in Mafia Island between 2003 and 2006. Further assessments should be carried out to build on previous research. However, additional advice is required from experts in sea turtle phylogenetics.

3.1.4 Which of the following methods have been or are being used to try to identify migration routes of turtles? Use the text boxes to provide additional details. [INF, PRI]

Tagging YES NO

Evidence from tag returns indicate that while some green turtles are probably resident, others are highly migratory moving to and from nesting and feeding grounds in Kenya, Seychelles, Comoros, Mayotte, Europa Island and South Africa (Muir 2005b).

Since 2003, 36 green turtles in Mafia have been tagged with titanium flipper tags with the series prefix TA. Most were nesting females (n: 29), whilst others were tagged during release from fishing gears (n: 7). Almost one third of those tagged (n: 10) have been encountered again during subsequent nesting events although those encounters were

opportunistic sightings rather than as a result of intensive nesting surveys. All re-encounters were on the same beach as the turtle was originally tagged. Eight re-encounters were during the same nesting season (2006). Two turtles were re-encountered three and six years after the original tagging event.

Since 2005, 18 green turtles have been tagged in Temeke District with titanium flipper tags with the series prefix TA. 17 were nesting females and one was an injured turtle found stranded on a beach. The tag was applied after four months in a captive rehabilitation programme. Only two tagged turtles have since been re-encountered.

Most nesting females in Mnemba Island are tagged with titanium flipper tags with the TA series prefix. However, the lodge is closed throughout April and May during the rainy season. Since this coincides with peak green turtle nesting season in Zanzibar, some turtles nesting during these months may not be tagged.

Loggerhead turtles are relatively rare in Tanzania and there is no indication that they nest. However, evidence from tag returns from individuals caught in nets off Mtwara and Mafia indicate that southern Tanzania and the Mafia area are important foraging grounds for loggerheads nesting in Tongaland and Natal, South Africa. Three tagged animals were caught in southern Tanzania in 1976. One animal swam a distance of at least 2,640km in 66 days between its release in Natal and its capture at Kilwa Masoko and a second animal accomplished a similar feat (Frazier 1976). Since 2001, tags have been recovered by Sea Sense from 5 loggerhead turtles caught in gillnets: 3 at Jibondo Island off southeast Mafia, and 2 off Songo Songo Island (Muir 2005b). All were tagged while nesting in Tongaland and Natal in South Africa (Muir 2003). During a prawn trawl bycatch survey in 2007, a loggerhead was caught and recorded in a net (Muir and Ngatunga in prep).

Migratory behaviour:

There is limited data available on sea turtle migratory behaviour in Tanzania. Flipper tag returns in Tanzania have originated in Kenya, Seychelles, Mayotte, Comoros Islands and South Africa but critical information is often missing including the exact location of the retrieved tag and the date of observation. This suggests that while some sea turtles are probably resident, others are highly migratory moving to and from nesting and feeding grounds in Kenya, Seychelles, Comoros, Mayotte, Europa Island and South Africa (Muir 2003).

Satellite tracking YES NO

Other

Five green turtles have been tagged with geolocator tags in Tanzania to investigate inter-nesting movements. One LTD 2000 series geolocation tag (LTD 2310 with stalk) was attached to the carapace of a nesting green turtle in Juani Island, Mafia District in May 2005. The tag was recovered 15 days later when the turtle returned to nest.

The tag was set to log light levels, depth and external temperature data at one minute intervals. The turtle spent a considerable proportion of the total mission time at a depth of 14m (14.73% of total mission). 11.64% of time was spent at the surface.

Dive depth reflected a relationship with daylight, with dive depth being shallower during hours of darkness (10 – 11m) and deeper during daylight hours (16 – 27m).

Analysis of dive profiles further underline the deeper daytime diving compared to night time dives. This behaviour may suggest that the turtle spent time resting on or near the bottom of her shallow coastal inter-nesting habitat at a depth close to where she may reach neutral buoyancy. By day 11 her night time dive profile became more erratic than previous mission days. By day 13 she spent a considerable time on the surface during the night. This may represent a non-nesting emergence, although this was not confirmed by a visual sighting by the night patrol team. Her erratic night time dive profiles continue for days 14 and 15, after which she nested and the tag was removed.

Location data indicates that the turtle travelled considerable distances during her inter-nesting period although there appeared to be a significant degree of error in the data collected by the LTD tag. Therefore no meaningful conclusions were made about the degree of inter-nesting movement.

A further two nesting green turtles were tagged with LTD 2000 series geolocation tags in 2005. Tags A1909b and A0323 were deployed on green turtles nesting on the mainland coast of Tanzania in Temeke District. However, the tags were never retrieved.

In 2006 two more tags (A0324 and A0348) were deployed on nesting green turtles in Juani Island, Mafia District. The tags were retrieved after 14 days and 20 days respectively. A0348 suffered significant damage, with the antennae being completely ripped from the tag. The A0324 suffered no external damage but it was not possible to retrieve data from either tag. Both tags were returned to Lotek for inspection but all data was lost.

None of the above

3.1.5 Have studies been carried out on marine turtle population dynamics and survival rates (e.g. including studies into the survival rates of incidentally caught and released turtles)? [INF, PRI]

YES NO UNSURE

Strandings of sea turtles are/have been recorded in monitoring programmes (e.g. Tanzania Turtle and Dugong Conservation Programme - Sea Sense) along the coast of Tanzania and Zanzibar (Slade 2000; Muir 2005b; Muir 2007). Where possible, the cause of death (e.g. drowning in gill nets) is noted. Unfortunately it is not always possible to accurately ascertain the cause of death.

Trawl and gillnet by-catch assessments have been done by Sea Sense in collaboration with TAFIRI, Duke University and WWF (Muir 2005b; St John and Muir 2006; Muir 2007b) and Frontier (Darwall 1996; Darwall and Coiseul 1996). Unfortunately, there is no estimate of the survival rates of live turtles released when incidentally captured.

3.1.6 Has research been conducted on the frequency and pathology of diseases in marine turtles? [INF, PRI]

YES NO UNSURE

3.1.7 Is the use of traditional ecological knowledge in research studies being promoted? [BPR, PRI]

YES NO UNSURE

e.g. Thiagarajan 1991; Clark and Khatib 1993; Khatib 1998.

3.2.1 List any regional or sub-regional action plans in which your country is already participating, which may serve the purpose of identifying priority research and monitoring needs. [INF]

In the Western Indian Ocean region, considerable efforts have been made to promote regional collaboration and to address regional issues relating to turtle conservation. The Sodwana (South Africa) meeting in 1995 resulted in the WIO Marine Turtle Conservation Strategy (IUCN/UNEP, 1996). In 2001, an informal Eastern African meeting was held in Mombasa to discuss progress since the Sodwana meeting and priorities for future work.

In June 2001, Tanzania signed up to the Memorandum of Understanding on the Conservation and Management of Marine Turtles of the Indian Ocean and South-East Asia (IOSEA), the overall goal of which is to protect, conserve, replenish and recover marine turtles and their habitats of the Indian Ocean and South-East Asia.

In 2004, a WIO Region Marine Turtle Workshop was held in Kenya to: bring together marine turtle experts and relevant stakeholders in research and conservation within the WIO region; share experiences and discuss networking options and opportunities; identify and prioritise regional turtle research and management needs; and draft a regional proposal to address research needs for consideration for funding under the Marine Science for Management Grant (MASMA) administered by WIOMSA. The workshop proceedings have been prepared by KESCOM (Muir 2005b).

Aim of ongoing SWIOFP project and beyond:

- Address large data gaps pertaining to sea turtles in Tanzania (location of key foraging grounds, inter-nesting movements, post nesting migrations)
- Identify level of threat from fisheries interactions (particularly commercial prawn trawling)
- Contribute to understanding of genetic structure of WIO populations
- Improve regional collaboration in developing mitigation measures for sea turtles
- Share knowledge and expertise with other regional experts

3.2.2 On which of the following themes have collaborative studies and monitoring been conducted? Use the text boxes to describe the nature of this international collaboration or to clarify your response. Answer 'NO' if the studies/monitoring undertaken do not involve international collaboration. [INF, PRI]

a) Genetic Identity YES NO NOT APPLICABLE

Collaboration between Sea Sense, University of Dar es Salaam and the French Research Institute for Exploitation of the Sea, IFREMER (St John and Muir 2006).

In 2006, Tanzania collaborated with a number of countries in the region on a genetic stock assessment of green turtles in the South West Indian Ocean.

b) Conservation status YES NO NOT APPLICABLE

c) Migrations YES NO NOT APPLICABLE

Collaboration with Seychelles, Comoros, Mayotte, Mozambique, Madagascar and South Africa on tags and tag returns.

Nesting turtles in Mafia and Zanzibar archipelagos and Temeke District should be included in migratory studies. Since nesting populations are very small in Tanzania, it is likely that high levels of mortality from fisheries interactions will have a major impact on the population. Therefore it is critical that areas of high risk are identified and mitigation measures developed.

There is limited data available on sea turtle migratory behaviour in Tanzania. Flipper tag returns in Tanzania have originated in Kenya, Seychelles, Mayotte, Comoros Islands and South Africa but critical information is often missing including the exact location of the retrieved tag and the date of observation. This suggests that while some sea turtles are probably resident, others are highly migratory moving to and from nesting and feeding grounds in Kenya, Seychelles, Comoros, Mayotte, Europa Island and South Africa (Muir 2003).

d) Other biological and ecological aspects YES NO NOT APPLICABLE

Tanzania also participated in a regional study of sea turtle bycatch in 2007, funded by Project Global.

In addition, sea turtle experts in Tanzania have provided advice to neighbouring countries on sea turtle management recommendations, particularly with reference to community conservation initiatives.

Other

3.3.1 List, in order of priority, the marine turtle populations in your country in need of conservation actions, and indicate their population trends. [PRI]

Hawksbills: downward

Green: downward

Loggerhead, olive ridley and leatherback: unknown

(See Frazier 1976; Thiagarajan 1991; Clark and Khatib 1993; Slade 2000; Muir 2005)

Turtle nesting sites in Mafia and Temeke Districts have been identified for long term monitoring. These locations are the two most important sea turtle nesting sites on the Tanzanian mainland. In addition, large data sets already exist for turtle nesting and mortality in these two districts so there is considerable potential to build on existing initiatives.

Mnemba and Pemba Islands in the Zanzibar archipelago should also be included in a long term monitoring programme as these are significant offshore nesting sites that support populations of both green and hawksbill turtles.

Populations in Mtwara should be included in a monitoring programme as important foraging grounds have been reported in that area and tag returns other countries in the region have been collected here suggesting that the area supports important foraging populations that may nest elsewhere in the region.

3.3.2 Are research and monitoring activities, such as those described above in Section 3.1 periodically reviewed and evaluated for their efficacy? [SAP]

YES NO UNSURE

3.3.3 Describe how research results are being applied to improve management practices and mitigation of threats (in relation to the priority populations identified in 3.3.1, among others). [SAP]

Nesting seasonality and nesting site data are helping to focus resources and improve efficiency of monitoring and nest protection as well as promote eco-tourism (Khatib 1998; Slade 2000; Muir 2004a; Muir 2005b).

3.4.1 Has your country undertaken any initiatives (nationally or through collaboration with other Range States) to standardise methods and levels of data collection? [BPR, INF]

YES NO UNSURE

The Tanzania Turtle Committee designed a standardized nest recording form for Tanzania.

3.4.2 To what extent does your country exchange scientific and technical information and expertise with other Range States? [SAP, IND]

OFTEN (SYSTEMATICALLY) OCCASIONALLY RARELY NEVER

3.4.3 If your country shares scientific and technical information and expertise with other Range States, what mechanisms have commonly been used for this purpose? Comment on any positive benefits/outcomes achieved through these interactions. [INF]

Attendance at the Annual Sea Turtle Symposium, Western Indian Ocean Marine Science Association (WIOMSA) and workshops.

3.4.4 Does your country compile and make available to other countries data on marine turtle populations of a regional interest? [INF]

YES NO UNSURE

OBJECTIVE IV. INCREASE PUBLIC AWARENESS OF THE THREATS TO MARINE TURTLES AND THEIR HABITATS, AND ENHANCE PUBLIC PARTICIPATION IN CONSERVATION ACTIVITIES

4.1.1 Describe the educational materials, including mass media information programmes that your country has collected, developed and/or disseminated. [INF, PRI]

Turtle education campaigns have already proved highly valuable as conservation tools in Zanzibar, Mafia, Kilwa and Mtwara (Slade *et al.* 1997; Muir and Abdallah 2003; Mahenge 2004).

4.1.2 Which of the following groups have been the targets of these focused education and awareness programmes described in above in Section 4.1.1? [PRI, INF]

- Policy makers
- Fishing industry
- Local/Fishing communities**
- Indigenous groups
- Tourists**
- Media**
- Teachers**
- Students**
- Military, Navy, Police
- Scientists
- Other:
- None of the above

4.1.3 Have any community learning / information centres been established in your country? [BPR, SAP]

YES NO

4.2 Alternative livelihood opportunities [IND, BPR] Describe initiatives already undertaken or planned to identify and facilitate alternative livelihoods (including income-generating activities) for local communities.

On Zanzibar and Mafia, involvement of local communities in nest protection, monitoring, data collection and awareness raising has played a key role in reducing threats to turtles. The provision of financial incentives is a conservation option, and is practiced in some areas in the region. There are of course dangers associated with incentive-driven conservation, the most important of which is financial sustainability. However, in areas where mortality (through turtle and egg poaching) has reached critical levels, financial rewards may be the only realistic short-term solution. In the longer-term it may be possible to generate revenue to fund turtle conservation through turtle tourism and park entry fees.

On Zanzibar, cash incentives have been found to be counter-productive to obtaining committed public participation (Khatib *et al.* 1996). However, in Mafia and Mtwara modest incentives, averaging US\$7 and US\$3 per nest respectively, have proven highly effective in involving local communities and in protecting nests.

4.3.1 Describe initiatives already undertaken or planned by your country to involve local communities, in particular, in the planning and implementation of marine turtle conservation programmes. Please include details of any incentives that have been used to encourage public participation, and indicate their efficacy. [BPR, IND]

See above

4.3.2 Describe initiatives already undertaken or planned to involve and encourage the cooperation of Government institutions, NGOs and the private sector in marine turtle conservation programmes. [IND, BPR]

In September 2003, the national Tanzania Turtle Committee was established to conserve and manage marine turtles as part of Tanzania's commitment as a signatory to the Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-east Asia under the auspices of the Convention on Migratory Species.

The Committee is represented by the Fisheries Division, Wildlife Division, Environment Division, Marine Parks and Reserves Unit, Tanzania Fisheries Research Institute and the Faculty of Aquatic Science and Technology of University of Dar es Salaam from mainland Tanzania, and the Departments of Environment and Fisheries from Zanzibar. The Association of Prawn Trawlers Operators is invited when deemed necessary. The Committee has met periodically, with financial support made available by WWF-Tanzania.

OBJECTIVE V. ENHANCE NATIONAL, REGIONAL AND INTERNATIONAL COOPERATION

5.1.1 Has your country undertaken a national review of its compliance with Convention on International Trade in Endangered Species (CITES) obligations in relation to marine turtles? [SAP]

YES NO NOT APPLICABLE

5.1.2 Does your country have, or participate/cooperate in, CITES training programmes for relevant authorities? [SAP]

YES NO NOT APPLICABLE

5.1.3 Does your country have in place mechanisms to identify international illegal trade routes (for marine turtle products etc.)? Please use the text box to elaborate on how your country is cooperating with other States to prevent/deter/eliminate illegal trade. [SAP]

YES NO NOT APPLICABLE

5.1.4 Which international compliance and trade issues related to marine turtles has your country raised for discussion (e.g. through the IOSEA MoU Secretariat, at meetings of Signatory States etc.)? [INF]

5.1.5 Describe measures in place to prevent, deter and eliminate domestic illegal trade in marine turtle products, particularly with a view to enforcing the legislation identified in Section 1.5.1. [INF]

In Tanzania, all species listed on Appendix I of CITES are officially protected. On the mainland, turtles fall under the responsibility of the Fisheries Division (Ministry of Natural Resources and Tourism).

In the draft Fisheries Regulations, 2005, made under section 57 of the Fisheries Act of 2003, section 12 (1) (9) states that no person shall kill or fish sea turtles or possess a sea turtle shell or deal in sea turtle shells or any other species listed as endangered in any International convention to which the United Republic is a party. In the case of a first offence, the fine is TSh 200,000 or a 3 month sentence, and in the case of a second and subsequent offence, the offender is fined TSh 300,000 or a 6 month sentence, or both.

5.2.1 Has your country already developed a national action plan or a set of key management measures that could eventually serve as a basis for a more specific action plan at a national level? [IND]

YES NO

Recognising the need to address declining turtle populations in Zanzibar, a study was commissioned by the Department of the Environment in 1999 to develop a long-term strategy for turtle conservation. This resulted in a Turtle Recovery Action Plan for Zanzibar (Slade 2000). One of the major activities proposed in the recovery plan was the creation of an interdepartmental Turtle Conservation Committee (TTC) to oversee the implementation of the activities recommended.

In response to the recommendation, the Zanzibar National Turtle Conservation Committee was formed on 5 January 2002, comprised of 12 members representing local communities and relevant government institutions. On-going activities include environmental awareness and monitoring.

Also, in September 2003, the national Tanzania Turtle Committee was established to conserve and manage marine turtles as part of Tanzania's commitment as a signatory to IOSEA. The Committee is represented by the Fisheries Division, Wildlife Division, Environment Division, Marine Parks and Reserves Unit, Tanzania Fisheries Research Institute and the Faculty of Aquatic Science and Technology of University of Dar es Salaam from mainland Tanzania, and the Departments of Environment and Fisheries from Zanzibar.

5.2.2 From your country's perspective, which **conservation and management activities, and/or which particular **sites or locations**, ought to be among the highest priorities for action? [PRI]**

Nest protection and monitoring in Mafia (Shungi-mbili, Juani and Kugwi), Temeke (Amani Gomvu), Saadani (Madete), Pangani (Maziwe), Unguja (Mnemba and Matemwe) and Pemba (Misali)

Education - all along the coast

Enforcement - all along the coast

By-catch reduction - particularly in the gillnet fishery

5.2.3 Please indicate, from your country's standpoint, the extent to which the following **local management issues require **international** cooperation in order to to achieve progress. [PRI]**

Illegal fishing in territorial waters	<input checked="" type="checkbox"/> ESSENTIAL <input type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Incidental capture by foreign fleets	<input type="checkbox"/> ESSENTIAL <input checked="" type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Enforcement/patrolling of territorial waters	<input checked="" type="checkbox"/> ESSENTIAL <input type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Hunting/harvest by neighboring countries	<input type="checkbox"/> ESSENTIAL <input checked="" type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Poaching, illegal trade in turtle projects	<input type="checkbox"/> ESSENTIAL <input checked="" type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Development of gear technology	<input type="checkbox"/> ESSENTIAL <input checked="" type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Oil spills, pollution, marine debris	<input type="checkbox"/> ESSENTIAL <input checked="" type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Training / capacity-building	<input type="checkbox"/> ESSENTIAL <input checked="" type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Alternative livelihood development	<input type="checkbox"/> ESSENTIAL <input checked="" type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Identification of turtle populations	<input type="checkbox"/> ESSENTIAL <input type="checkbox"/> IMPORTANT <input checked="" type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Identification of migration routes	<input type="checkbox"/> ESSENTIAL <input checked="" type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Tagging / satellite tracking	<input checked="" type="checkbox"/> ESSENTIAL <input type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Habitat studies	<input checked="" type="checkbox"/> ESSENTIAL <input type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL
Genetics studies	<input checked="" type="checkbox"/> ESSENTIAL <input type="checkbox"/> IMPORTANT <input type="checkbox"/> LIMITED <input type="checkbox"/> NOT AT ALL

5.3.1 Identify existing frameworks/organisations that are, or could be, useful mechanisms for cooperating in marine turtle conservation at the sub-regional level. Please comment on the strengths of these instruments, their capacity to take on a broader coordinating role, and any efforts your country has made to enhance their role in turtle conservation. [INF, BPR]

In the Western Indian Ocean region, considerable efforts have been made to promote regional collaboration and to address regional issues relating to turtle conservation.

The Sodwana (South Africa) meeting in 1995 resulted in the WIO Marine Turtle Conservation Strategy (IUCN/UNEP, 1996). In 2001, an informal Eastern African meeting was held in Mombasa to discuss progress since the Sodwana meeting and priorities for future work.

In June 2001, Tanzania signed up to the Memorandum of Understanding on the Conservation and Management of Marine Turtles of the Indian Ocean and South-East Asia (IOSEA), the overall goal of which is to protect, conserve, replenish and recover marine turtles and their habitats of the Indian Ocean and South-east Asia.

In 2004, A WIO Region Marine Turtle Workshop was held in Kenya to: bring together marine turtle experts and relevant stakeholders in research and conservation within the WIO region; share experiences and discuss networking options

and opportunities; identify and prioritise regional turtle research and management needs; and draft a regional proposal to address research needs for consideration for funding under the Marine Science for Management Grant (MASMA) administered by WIOMSA. The workshop proceedings have been prepared by KESCOM.

Tanzania is also a member of the WIO MTTF and Tanzanian delegates attend all regional meetings and workshops.

5.3.2 Has your country developed, or is it participating in, any networks for cooperative management of shared turtle populations? [BPR, INF]

YES NO NOT APPLICABLE

5.3.3 What steps has your country taken to encourage Regional Fishery Bodies (RFBs) to adopt marine turtle conservation measures within Exclusive Economic Zones (EEZs) and on the high seas? [SAP]

5.4.1 Describe your country's needs, in terms of human resources, knowledge and facilities, in order to build capacity to strengthen marine turtle conservation measures. [PRI]

To be completed

5.4.2 Describe any training provided in marine turtle conservation and management techniques (e.g. workshops held, training manuals produced etc.), and indicate your plans for the coming year. [PRI, INF]

Sea Sense has trained over 50 community Conservation Officers as well as district and hotel staff in turtle conservation techniques and has produced a training manual in English and Kiswahili.

5.4.3 Specifically in relation to [capacity-building](#), describe any partnerships developed or planned with universities, research institutions, training bodies and other relevant organisations. [BPR]

5.5.1 National policies and laws concerning the conservation of marine turtles and their habitats will have been described in Section 1.5.1. Please indicate their effectiveness, in terms of their practical application and enforcement. [SAP, TSH]

Although marine turtle conservation legislation is provided for in the Fisheries Act, 2003, the legislation is inadequate in scope and does not include reference to protection of turtle nesting or foraging grounds, or the compulsory use of Turtle Excluder Devices (TEDs) in trawl nets. Furthermore, reference of obligatory release of endangered species is made only in the case of trawlers and does not include gillnets, which pose a significant threat.

The Fisheries Division lacks the capacity to effectively enforce laws relating to turtle conservation in Tanzania. Limited personnel and equipment such as vehicles and patrol boats, particularly in rural areas, also hampers enforcement and as such the law is rarely applied.

5.5.2 Has your country conducted a review of policies and laws to address any gaps, inconsistencies or impediments in relation to marine turtle conservation? If not, indicate any obstacles encountered in this regard and when this review is expected to be done. [SAP]

YES NO UNSURE

5.5.3 From the standpoint of law enforcement, has your country experienced any difficulties achieving cooperation to ensure compatible application of laws across and between jurisdictions? [TSH]

YES NO UNSURE

OBJECTIVE VI. PROMOTE IMPLEMENTATION OF THE MoU INCLUDING THE CONSERVATION AND MANAGEMENT PLAN

6.1.1 What has your country already done, or will it do, to encourage other States to sign the IOSEA MoU? [INF]

Tanzania is a Signatory State of the IOSEA Marine Turtle Memorandum of Understanding.

6.1.2 Is your country **currently favourable, in principle, to amending the MoU to make it a legally binding instrument? [INF]**

YES NO NO VIEW

6.1.3 Would your country be favourable, over a **longer time horizon, to amending the MoU to make it a legally-binding instrument? [INF]**

YES NO NO VIEW

6.2 Secretariat and Advisory Committee

6.2.1 What efforts has your country made, or can it make, to secure funding to support the core operations of the IOSEA MoU (Secretariat and Advisory Committee, and related activities)? [IND]

6.3.1 What funding has your country mobilised for domestic implementation of marine turtle conservation activities related to the IOSEA Marine Turtle MoU? Where possible, indicate the specific monetary values attached to these activities/programmes, as well as future plans. [IND]

6.3.2 Has your country tried to solicit funds from, or seek partnerships with, other Governments, major donor organisations, industry, private sector, foundations or NGOs for marine turtle conservation activities? [IND]

YES NO

6.3.3 Describe any initiatives made to explore the use of economic instruments for the conservation of marine turtles and their habitats. [BPR]

6.4.1 Has your country designated a lead agency responsible for coordinating national marine turtle conservation and management policy? If not, when is this information expected to be communicated to the IOSEA MoU Secretariat? [IND]

YES NO

6.4.2 Are the roles and responsibilities of all government agencies related to the conservation and management of marine turtles and their habitats clearly defined? [IND]

YES NO UNSURE

6.4.3 Has your country ever conducted a review of agency roles and responsibilities? If so, when, and what was the general outcome? If not, is such a review planned and when? [SAP],

YES NO UNSURE

Comments/suggestions to improve the present reporting format:

Additional information not covered above: