Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia

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Bonn, Germany, 8-11 September 2014

SOCIO-ECONOMIC AND CULTURAL IMPLICATIONS OF MARINE TURTLE USE AND CONSERVATION

1. The following paper was prepared by the Secretariat in response to a need initially identified by the IOSEA Western Indian Ocean - Marine Turtle Task Force to compile information, in the form of a literature review, on social aspects of marine turtle conservation in the Western Indian Ocean. The Secretariat circulated a working draft of the paper in February 2014, which has since been updated to incorporate feedback from a small number of reviewers.

2. The scope of the present paper actually extends to the whole of the IOSEA region, in keeping with a similar request of the Sixth Meeting of IOSEA Signatory States to have a compilation of socio-economic considerations of marine turtle conservation with particular reference to public participation and stakeholder engagement.

3. The synthesis paper aims to achieve three main goals:

- To assess the extent of work already undertaken in community-based conservation over the past two decades in all IOSEA Signatory States, as well as the extent of published literature on socio-economics of marine turtle use and conservation in the IOSEA region;

- To highlight exemplary measures of conservation actions involving local stakeholders, as well as exemplary socio-economic research activities, that may serve as models for new initiatives in the IOSEA region;

- To identify needs and opportunities for improvement of local stakeholder involvement in marine turtle conservation, as well as in socio-economic research, at both national and regional levels.

4. Time permitting, the Secretariat hopes to prepare, before the Meeting, a short Executive Summary which will be appended to the full paper.

Action requested / Expected outcome

Signatory States are invited to make use of this document to draw conclusions and recommendations about socio-economic considerations as they relate to marine turtle conservation and use, as well as additional research that may be required to fill knowledge gaps. The paper will be relevant to other deliberations concerning the overall review of IOSEA implementation, as well as sub-regional group discussions.

Socio-economic and cultural implications of marine turtle use and conservation: a review of the literature from the IOSEA region

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Version 2: 3 August 2014

Introduction

This paper has been prepared partly in response to a long-standing need for the IOSEA Western Indian Ocean - Marine Turtle Task Force[1] to compile information, in the form of a literature review, on social aspects of marine turtle conservation in the Western Indian Ocean. The scope of the present paper actually extends to the whole of the IOSEA region, in keeping with a request of the Sixth Meeting of IOSEA Signatory States to prepare a compilation of socio-economic considerations of marine turtle conservation with particular reference to public participation and stakeholder engagement.

The paper aims to achieve three main goals:

1. To assess the extent of work already undertaken in community-based conservation over the past two decades in all IOSEA Signatory States, as well as the extent of published literature on socio-economics of marine turtle use and conservation in the IOSEA region;

2. To highlight exemplary measures of conservation actions involving local stakeholders, as well as exemplary socio-economic research activities, that may serve as models for new initiatives in the IOSEA region;

3. To identify needs and opportunities for improvement of local stakeholder involvement in marine turtle conservation, as well as in socio-economic research, at both national and regional levels.

[1] The Western Indian Ocean - Marine Turtle Task Force (WIO-MTTF) is a technical working group comprised of specialists from eleven countries in the Western Indian Ocean – Comoros, France, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, South Africa, United Kingdom, and United Republic of Tanzania – most of which are also signatories to the IOSEA Marine Turtle MoU. The Task Force also benefits from participation of inter-governmental, academic, and non-governmental organisations within the region. In October 2013, the WIO-MTTF organised a workshop in the margins of the Eighth Western Indian Ocean Marine Science Association Scientific Symposium, where social scientists and conservationists were invited to present aspects of their work.

Contents

Background

Methodology

The paper was developed in two successive steps:

1. Inventory of past and present conservation initiatives undertaken in Signatory States by a wide range of actors, directly or indirectly involving local stakeholders – such as fishermen, indigenous and coastal communities, students, etc. Initiatives to facilitate alternative livelihoods were also identified, and best practices and needs were highlighted in the Excel matrix;

2. Compilation of a descriptive list of studies published after 1995, addressing the socio-economic and cultural implications of marine turtle use and conservation in the IOSEA region (Appendix 1).

Considering that information on the overall effectiveness and potential for replication of identified activities is often incomplete, outdated or missing, the present study's aim is mostly limited to providing a description of initiatives already undertaken and ongoing in the IOSEA region, without claiming to draw conclusions related to their efficacy.

The document draws upon several sources of information including (in no particular order of importance): annual national reports submitted by Signatory States to the IOSEA Secretariat; publications available in paper format at the Secretariat, as well as resources of the IOSEA website (projects database, features, online bibliography etc.); websites of NGOs and of other marine turtle conservation actors that give examples of stakeholder involvement or the facilitation of alternative livelihoods; as well as various press and scholarly articles referenced on the Web.

All information extracted from these sources was compiled in a large Excel matrix – not reproduced here – which was then analysed and synthesized to lead to the present report.

The document remains a work in progress inasmuch as there are certainly many more relevant publications, in both the published and grey literature, which have not yet been identified through the review process. Therefore we hope that by circulating this document in draft form readers will be encouraged to draw attention to other important sources of information addressing the socio-economic and cultural implications of marine turtle use and conservation in the IOSEA region.

1. Review of studies addressing socio-economic and cultural implications of marine turtle use and conservation in the Indian Ocean

As a preliminary remark, a wealth of studies dealing with the socio-economics of marine resources in the IOSEA region have been undertaken over the last two decades, but this report focuses on studies specific to marine turtles. In the text that follows, the specific references that have been cited have been included in the bibliography (Appendix 2) which is organised by country.

As for the type of literature found, most studies of interest are in the published literature, having been conducted by individuals, NGOs and government institutions. Eight PhDs are cited (Gaspar 2010; Grayson 2011; Kamrowski *et al.* 2012; Weiss 2011; Jones 2012; Lilette 2006; Nursey-Bray 2006; Pendoley 2005). The vast majority of references mentioned below, especially the most recent ones, are freely available on the Web at the time of writing.

Over the past two decades, practically all IOSEA Signatory States were found to have been the source of some socio-economic studies addressing the issues of resource use by coastal communities, economic and traditional valuation of turtle products, as well as cultural and social implications of human-turtle interactions. **Australia, Indonesia, Madagascar, Malaysia**, **Sri Lanka and United Republic of Tanzania** appear to be the countries where these issues have been most widely

investigated. Furthermore, the economic aspects of marine turtle use and conservation were also thoroughly investigated at a global scale by WWF in 2004. The territories of **Jordan**, **Myanmar**, **United Arab Emirates, United States** and **Yemen** were among the few exceptions, where no such study were conducted - although the United States have done so in other IOSEA countries such as Malaysia, Indonesia and Papua New Guinea. This is not to say that such studies have not been undertaken in these countries. Some research may well have been published in languages other than English or may not be readily available for consultation with the resources available. In **Pakistan**, no socio-economic study specific to marine turtles could be found either, however a broader socio-economic study focusing on the economic dependence of various local communities on marine resources was identified (Hasan 2011).

1.1 Socio-economic studies addressing the impacts of human activities on marine turtles

Some general studies addressing all possible local human threats to turtles were conducted in **Malaysia** (Chan 2006), **Mozambique** (Louro *et al*. 2006) and **Seychelles** (Mortimer 1998); elsewhere, studies were found to be threat-specific (as reported below). Most studies addressing the impact of human activities on marine turtles made use of local knowledge.

1.1.1 Studies addressing marine turtle – fisheries interactions

Studies assessing the impact of fisheries on marine turtles have been conducted in a slight majority of IOSEA countries (17), most of them taking into account local stakeholder knowledge through the use of questionnaire surveys. The three countries concerned with most publications on the topic are **India** (Pandav, & Choudhury 1999; Pandav, & Choudhury 1997; Rajagopalan *et al.* 2001; Rajagopalan *et al.* 1996; Varghese 2010; Wright & Mohanty 2002), **Thailand** (Adulyanukosol & Ruangkaew 2003; Shiba *et al.*2002; Tsaros & Aureggi 2007) and **France**, in its Indian Ocean territories (Claro & Forin-Wiart 2010; Poisson 2007; Pusineri & Quillard 2008).

Additionally, studies investigating turtle – fisheries interactions were conducted in 14 other IOSEA countries, namely **Bahrain** (Abdulqader 2008; Abdulqader 2006), **Cambodia** (Longdy 2002), **Comoros** (Moore *et al.* 2010; Poonian *et al.* 2008; Poonian 2008), **Eritrea** for a period extending from 1994 to 2004 (Teclemariam *et al.* 2006), **Indonesia** (Roe *et al.* 2014; Zainudin *et al.* 2007), **Madagascar** (Walker & Roberts 2005), **Malaysia** (Bin Wagiman *et al.* 2006; Wahab *et al.* 2013; Pilcher *et al.* 2007), **Maldives** (Anderson *et al.* 2009), **Mozambique** (Gove *et al.* 2001; Guissamulo *et al.* 2003), **Seychelles** (Domingue & Mortimer 2001), **South Africa** (Petersen *et al.* 2009; Young 2001), **Sri Lanka** (Kapurusinghe & Saman 2002), **Tanzania** (Moore *et al.*2010) and **Viet Nam** (WWF 2007). Currently, nine countries are reportedly administering observer programmes onboard their vessels, including a by-catch questionnaire, according to an analysis of latest available IOSEA and IOTC National Reports submitted by IOSEA Signatory States.

Some research activity on the impacts of fisheries on marine turtles is reported to be ongoing at the time of writing. The Marine Research Foundation is currently conducting research in **Malaysia** on the impacts of blast fishing on sea turtles[2], and in Madagascar socio-economic surveys on the impacts of current fishing practices on turtles were conducted by the the NGO SEE[3] as well as by C3-Madagascar and Indian Ocean Islands Programme (Whitty 2010). These studies have so far not led to any publication. The Sixth WIOMSA Scientific Symposium, held in La Réunion in 2009, included the presentation of a study quantifying incidental turtle captures by beach seining in specific areas of **Mozambique** (Guissamulo *et al.* 2009). This list could undoubtedly be expanded to include many examples from workshops mentioning marine turtle – fishery interactions in other IOSEA countries.

[2] See http://www.mrf-asia.org/projects_view.cfm?THE_ID=38.
[3] See http://seeconservation.org/Madagascar%20Marine.html.

In addition to research activities focused on a single country, some studies also investigated the socio-economic drivers of Indian Ocean fisheries interactions with marine turtles at the scale of the whole IOSEA region or on smaller sub-regions. Recently, the socio-economic drivers of Indian Ocean fisheries interactions with marine turtles were investigated in an area covering **Comoros, Mauritius and Madagascar** (Poonian & Whitty, unpublished). As far as published studies are concerned, Moore *et al.* (2010) conducted interviews to assess marine turtle captures in artisanal fisheries in seven countries including **Comoros**, **Malaysia and Tanzania**. A comprehensive assessment of marine turtle by-catch by all fisheries operating in the **Western Indian Ocean** was published in 2008, identifying a paucity of reliable published information regarding turtles – fisheries interactions in this sub-region (Bourjea *et al* 2008). An important study was also conducted on European purse seine tuna fisheries operating in the whole of the **Indian Ocean**, based on data collected from 2003 to 2007 by the compulsory sampling programme conducted under the European Union Data Collection Regulation (Amande *et al.* 2008). Finally, some major studies were also conducted globally, including the Indian Ocean in their scope (Lewison *et al.* 2014; Wallace *et al.* 2013; Wallace *et al.* 2010) – revealing data gaps in that part of the world oceans (Wallace *et al.* 2013).

Furthermore, several workshops at a regional level held over the last decade addressed the issue of marine turtle mortality due to fisheries. A workshop on regional cooperation to combat illegal fishing of marine turtles, mainly by Chinese vessels, was organised in **Malaysia** in 2009 (Chan *et al.* 2009). For a number of years, the IOTC Working Party on Ecosystems and Bycatch (WPEB) has examined fisheries bycatch of a range of marine species, including turtles. The potential of ultraviolet illumination of gillnets as a method to reduce sea turtle bycatch (Wang et al 2013; WWF 2013) was noted in its last workshop (La Réunion, September 2013). Additionally, several dedicated workshops were organised by FAO within the framework of a marine turtle by-catch related initiative undertaken in the last decade, including the FAO (RECOFI) workshop on Bycatch Management and Low Impact Fishing in 2012 in **Kuwait** (FAO 2013); one in **Tanzania** which presented studies on by-catch for the whole IOSEA region (FAO 2006); one in **Mozambique** in 2005 on bycatch in prawn fisheries, which was attended by participants from Kenya, Madagascar, Maldives, Mauritius, Mozambique, Seychelles, South Africa, Somalia and the United Republic of Tanzania (FAO 2009); one on incidental catch of non-targeted marine species in the WIO held in **La Réunion** in 2006 (Kiszka & Muir 2007); and two FAO workshops held in Thailand, one in partnership with SEAFDEC in 2007 covering Southeast Asia (FAO 2007) and a technical consultation in 2004 (FAO 2004). Finally, a WIO workshop on incidental catch of non-targeted marine species was held in La Réunion in 2006 (Kiszka & Muir 2007).

1.1.2 Studies assessing the unsustainable use of marine turtles by coastal communities

Such studies typically deal with the issues of egg collection, turtle trade and turtle consumption by local communities.

The level of trade, use or consumption of turtles and their socio-economic drivers has been investigated in at least 17 countries, especially in **Indonesia** (Adnyana & Frazier 2003; Hilterman & Goverse 2005; ProFauna Indonesia 2005; Van Dijk & Shepherd 2004; Van Dijk & Shepherd 2004), **Madagascar** (Walker & Fanning 2003; Walker *et al.* 2004; Gibbons & Remaneva 2011) and **Viet Nam** (TRAFFIC Southeast Asia - Indochina 2004; Stiles 2008; Van Dijk & Shepherd 2004). Of particular relevance is the innovative conservation approach pioneered by the NGO ReefDoctor since 2008 to evaluate the Vezo marine turtle fishery in Southwest **Madagascar**. The project collated ethnographic information to assess patterns of turtle-human interactions, alongside biological data on the capture and consumption rates of marine turtles. Since the inception of this project, over 1,500 marine turtles have been captured and slaughtered in the Ranobe region (Gibbons & Remaneva 2011). Other countries where such studies have been undertaken include Australia (on cultural harvest of Green turtles in protected areas, Nursey-Bray 2006), **Bangladesh** (Islam 2001; Rahman 2006),

Cambodia (Lehr & Holloway 2002), **India** (Cornelius *et al.* 2007), **Islamic Republic of Iran** (Mobaraki 2010), **Kenya** (Nzuki 2005; Nzuki 2004), **Malaysia** (WWF 2009), **Maldives** (Currey & Matthew 1996), **Mauritius** (Griffiths & Tatayah 2007), Mozambique (Williams 2013), **Papua New Guinea** (TRAFFIC 2009), **Sri Lanka** (Rajakaruna *et al.* 2012; Richardson 2002), and **Tanzania** (Muir 2005). It is noteworthy that a history of turtle exploitation in the Chagos Archipelago (**United Kingdom**) was also documented by Mortimer (2009), and that ProFauna **Indonesia** investigated what they identified as "sea turtle exploitation in the name of conservation" in five locations in Bali (ProFauna Indonesia 2008). Moreover, in May 2012, a special task force was appointed to investigate the trade, hunting, sale, and killing of marine turtles in Cebu, **Philippines**[4] but no report has been found. Finally, a regional study on marine turtle use in **Southeast Asia** was also conducted more than ten years ago (Chan & Shepherd 2002)

1.1.3 Studies assessing the impacts of coastal development and human presence on marine turtles

The impacts of coastal development on marine turtle populations were investigated in most countries, such as in Australia (Pendoley 2005), **Bangladesh** (Islam 2005; Islam 2002), **France** (Collet & Martin 2005), **India** (Chaudhari *et al.* 2009) and **Malaysia** (Sharma *et al.* 1996), to name a few. Several case studies on habitat destruction and disturbance were also presented during a thematic workshop held during the Fifth Meeting of the IOSEA Signatory States in Bali in 2008[5]. More specific studies on the impact of light pollution on turtle orientation responses have also been conducted in three IOSEA countries, namely **Australia** (Maethger *et al.* 2011; Kamrowski *et al.* 2012), **India** (Karnad 2009) and **Oman** (ESO 2009). Papers focusing on relevant mitigation measures actually implemented in countries of the IOSEA region, including the socio-economic aspects of such measures, have yet to be identified.

1.2 Studies addressing the socio-economic and cultural implications of marine turtle conservation

1.2.1 Studies investigating indigenous knowledge and local governance of marine turtles

At a national level, seven IOSEA Signatory States were the source of research activities on indigenous knowledge of marine turtles, particularly in the Western Indian Ocean. This topic was studied in depth in **Kenya**, mostly through Participatory Rural Appraisal (PRA) surveys which assessed public perceptions of marine turtles (Wamukota & Okemwa 2008), and also through an important study on the economic valuation of marine turtles by local communities (Mwakha 2011). **Madagascar** was also the source of several significant socio-economic studies on the topic, three of them describing the social and traditional values of marine turtles to local communities (Muttenzer 2007; Langley 2006; Lilette 2006); and one investigating trends in turtle meat taste preferences (Jones 2012). Assessments of local knowledge and attitudes towards marine turtles were also conducted in **Seychelles** (Mortimer 2004), **Sri Lanka** (Rajakaruna *et al.* 2009) and **Tanzania**, where a national questionnaire survey of 450 respondents was carried out in 2003 by the NGO Sea Sense. In the SEA$^+$ sub-region, the Torres Strait Regional Authority of **Australia** is currently collecting data to develop a "Traditional Ecological Knowledge System" in Torres Strait to help estimate the levels of turtle catch (unpublished)[6] and a PhD thesis explored the characteristics of the green turtle fishery in Torres Strait to identify opportunities for management (Grayson 2011). An interesting study undertaken in **Brunei**

[4] See IOSEA Headline 21 May 2012
[5] Seven Power Point Presentations from that meeting related to the subject matter are available at http://www.ioseaturtles.org/electronic_lib.php
[6] See: https://fieldcapture.ala.org.au/project/index/0e980f48-33d4-4dbf-8334-ca3f4d3ff53e

Darussalam investigated perceptions and awareness of marine turtle conservation issues among local fisher communities and identified many areas in which communication of information needed improvement (Wahab *et al.* 2013).

As for studies focusing on community-driven approaches to turtle management, the North Australian Indigenous Land and Sea Management Alliance (NAILSMA) conducted research in **Australia** in the period 2007-2008 on community-based harvest monitoring, as well as on the socio-economic determinants of traditional harvest (Buchanan *et al*. 2009).

On a sub-regional scale, WIOMSA has completed a project on the effectiveness of Community-Based Organizations (CBOs) in managing coastal resources in the WIO, leading to about ten publications of interest[7]. Besides, it is currently conducting Community-Based PRAs on the implications of WIO global markets and coastal livelihoods for sustainable coastal management[8].

1.2.2 Studies assessing the impacts of conservation and management interventions on the livelihoods of local communities (social resilience)

Such studies appear to have been undertaken in eight countries of the IOSEA region. In **Australia**, relationships among stakeholders in marine turtle management were explored using social network analysis techniques (Weiss 2011). In **Indonesia**, Gjertsen and Hitipeuw (2006) explored the implications of paying villagers to patrol leatherback beaches in Saubeba, Papua (Jamursba Medi) by conducting household surveys. In the **Philippines**, a comprehensive social and institutional assessment of the Turtle Islands sanctuary (Cola 1998; Cola 2003; WWF 2005) found limited impacts of the ban on turtle egg collection on households, due to the fact that this activity was a minor source of income compared to fishing. Local stakeholder perceptions of protected area management and of marine turtle conservation measures were collected and analysed in **Mozambique** for the Ponta do Ouro Marine Protected Area (MPA) (Gaspar 2010) and in **Comoros** for the Moheli Marine Park (MMP) (C3-Comoros 2007). Similarly, social resilience after the adoption of marine turtle conservation measures was widely explored in 13 coastal communities of **Madagascar**'s marine protected areas (Cinner *et al.* 2009) and on the Huon Coast of **Papua New Guinea** (Kinch 2006). More specifically, the consequences of the adoption of various fisheries bycatch mitigation measures on traditional fishing communities have been evaluated in **India** (Mathew 2004; Rajagopalan 2009) and **Madagascar** (Davies *et al.* 2009).

At a regional scale, the US Southwest Fisheries Science Center conducted extensive research using interviews from 2004 to 2008 on the benefits and costs to local stakeholders of Pacific leatherback conservation projects. About 15 publications resulted from these studies, which were conducted in five countries including **Malaysia**, **Indonesia** and **Papua New Guinea**.

Overall, Agrawal and Redford (2006) have lamented the lack of evidence worldwide on the potential for community-based wildlife management to deliver both socioeconomic benefits and biodiversity conservation.

1.2.3 Studies on the facilitation of alternative livelihoods and its potential and current socio-economic implications

Studies exploring ways to assimilate tourism into marine turtle conservation have been reported in six countries, most significantly in **Indonesia** (with a major paper by Waayers 2006), but also in **Bangladesh** (Hasan 2009), **France** (Guillem 2006), **Madagascar** (Ramamonjisoa 1997), and **Australia** / **Sri Lanka** (Tisdell & Wilson 2003). The effectiveness of ecotourism activities, including sea turtle hatcheries, for community development was evaluated in **Sri Lanka** (Okuyama *et al.*2003;

[7] See: http://www.wiomsa.org/index.php?option=com_content&view=article&id=281&Itemid=301
[8] See: http://bit.ly/MEln7p.

Clem & Wilson 2003); while the potential viability of marine turtle businesses was assessed in **Australia** (Webb *et al.* 2008). Ferraro and Gjertsen (2009) found that many sea turtle incentive payment initiatives taken around the world, mostly on nesting beach protection, have achieved substantial results for a very low annual cost.

There are probably many published and unpublished studies on hatchery techniques and practices around the IOSEA region, with some relevance to eco-tourism centred on marine turtles, two of which (Ibrahim *el al.* 2002; Van de Merwe *et al.* 2002) were reported to the SEASTAR2000 scientific symposium. In 2004, SEAFDEC published "A Guide to Set-up and Manage Sea Turtles Hatcheries in the Southeast Asian Region" (Ali *et al.* 2004), judiciously noting that relocation of eggs to a protected hatchery site should be undertaken only as a last resort and only in case where *in situ* protection is impossible.

2. Past and current awareness-raising activities targeted to local communities

The potential contribution of education to marine turtle conservation stems from its ability to create a transmissible conservation ethic where it may initially be absent, at least according to conventional norms. Evidently this fact has been largely acknowledged by IOSEA Signatory States over the past two decades: indeed, all of them, with different intensity and results, but without exception, have made use of this conservation tool. This may be understandable considering the lower cost and greater visibility of awareness-raising initiatives, compared to other types of conservation interventions.

The number and scope of awareness-raising activities was found to be very uneven amongst IOSEA Signatory States, with the most prolific countries being **Australia, Bangladesh, France, India, Kenya, Malaysia, Mozambique, Philippines, Seychelles and Thailand**. These countries were often the same ones where marine turtle conservation projects had been undertaken in the same time frame, given that many conservation projects include an educational component. The IOSEA Year of the Turtle campaign organised in 2006 contributed to a peak in awareness-raising activities in IOSEA countries, including launch events, community workshops, festivals, and beach clean-ups, as well as the production and diffusion of an impressive amount of awareness-raising information materials, such as posters, postage stamps, T-shirts and caps.

Although past awareness-raising activities conducted in IOSEA countries primarily focused on children, an important number of them also reached fishermen (e.g. through workshops on sustainable fishing practices and techniques to handle injured marine turtles) and also the community as a whole (e.g. through meetings with community leaders or associations). Initiators of education programmes were commonly attributed to national or local governments, but they also include NGOs and, to a lesser extent, the private sector.

2.1 Education and awareness-raising activities

In the last two decades, publications and broadcasts were used for the purpose of awareness-raising in all IOSEA Signatory States, including articles, movies, sign boards, PowerPoint presentations, net kits, guides for fishermen, etc. Such materials were typically diffused through lectures, technical workshops and public screenings. In **Australia,** a video on methods for de-hooking and line-cutting was distributed directly to all Australian pelagic longline vessels by the NGO OceanWatch[9].

Other more playful approaches, perhaps more apt to give local stakeholders a sense of personal involvement – including competitions, interactive games, theatre plays and rallies – were reported in 16 countries, namely **Australia**, **Bangladesh**, **Comoros**, **Eritrea**, **France**, **Jordan**, **Kenya**,

[9] Source: IOSEA Australia National Report.

Madagascar, **Mauritius**, **Oman**, **Sri Lanka**, **United Arab Emirates, United Kingdom**, **United Republic of Tanzania**, **United States** and **Viet Nam.** Additional activities that may have been undertaken in other countries have yet to be identified.

Furthermore, beach cleaning events conducted to raise awareness about the need for habitat conservation were reported in 12 countries, notably in **Bangladesh, Eritrea, France, Iran, Jordan, Kenya, Malaysia, Mauritius, Oman, Philippines, South Africa** and **Thailand**. Turtle adoption programmes were also launched in six countries – namely **Islamic Republic of Iran**, **Oman** and the **United Arab Emirates** – through the sponsorship of an annual Great Gulf Turtle Race, and in **Kenya**, **Malaysia** and **South Africa** by private ventures. Finally, public releases of turtle hatchlings, mostly organised by private resorts and businesses, have taken place in at least five countries: **Indonesia** (between 2008 and 2013 by the Banyan Tree Bintan Hotel & Resort), **Iran** (in 2006 by the Government), **Malaysia** (in 2008 by AQUARIA KLCC), **Maldives** (since 2001 by several resort islands[10]) and **Thailand** (ongoing by the Royal Thai Navy and various hotels[11])

Besides, nine IOSEA Signatory States were reported to have permanent information centres dedicated to marine turtles. Such countries include **Australia** (Mon Repos Conservation Park), **Bangladesh** (Sea Turtle Education & Awareness Center on Sonadia Island), **Comoros** (Marine Turtle House in Itsamia), **France** (Kélonia - CEDTM in La Réunion), **Indonesia** (Sea Turtle Foundation Visitor Centre and WWF Turtle Conservation and Education Center (CTEC) in Bali), **Kenya** (Watamu Turtle Watch Interactive Marine Information Centre), **Malaysia** (Ma' Daerah Turtle Sanctuary Centre, Juara Turtle Visitor centre), **Oman** (Ras al Jinz Scientific and Visitors' Centre) and **Thailand** (Royal Thai Navy Sea Turtle Conservation Center).

2.2 Examples of innovative practices

Reviewing the literature for some original / best practices in turtle conservation education, the governmental "Dalaw-Turo" (Visit and Teach) Program conducted in the **Philippines** from 1992 to 2005 provides a good example of an innovative, informal participatory approach to raise public awareness on a national scale through the use of various forms of folk media. More recently from 2005 to 2012, in **Pakistan**, the GEF/UNDP-funded Pakistan Wetlands Programme (PWP), active at three beaches owned by the Daran Community, has reportedly exploited the authority of influential religious leaders to increase the effectiveness of its outreach component[12]. In **Indonesia**, Balinese Hindu priests have helped to reduce the use of turtle meat in religious ceremonies by declaring this practice to be non-compulsory[13]. In addition to religious statements, joint decrees were adopted by Governors of Bali and West Nusa Tenggara prohibiting the consumption of turtle meat at religious ceremonies – though a proportion of turtle meat is still used for religious ceremonial events in Bali and for cultural events in Enu island, Moluccas (WWF Indonesia 2005). In the **Islamic Republic of Iran**, Grand Ayatollahs have stated that from a religious point of view eating of turtle eggs and meat is prohibited[14]. Invocation of religious teaching and beliefs might be worthy of exploration in other countries where religion (or other forms of institutional authority) is held in high regard by the general public.

The "National Day of Marine Turtles" held annually in Mohéli Marine Park in **Comoros**, and reported to be increasingly frequented since 1999, is an example of a festival that has managed to maintain its longevity through different activities organised with a focus on the youth[15]. As for spectacular awareness-raising operations, in 2010 the Eritrean Navy publicly displayed a giant model

[10] Source: IOSEA Malaysia National Report.
[11] Source: IOSEA Thailand National Report.
[12] Source: IOSEA Pakistan National Report.
[13] Source: IOSEA Indonesia National Report.
[14] Source: IOSEA Iran National Report.
[15] Source: IOSEA Comoros National Report.

of a marine turtle which was broadcast live on the Eritrea national television chain (ERI-TV), and reportedly reached millions of nationals and foreigners. In 1995 the **Tanzanian** government collected turtle products and organised their symbolic burning to mark the end of turtle trade[16]; and in 1998 the **Seychelles** Government publicly burned its stockpile of 2.5 tons of raw turtle shell (Mortimer 1999).

At the outset of this paper, it was noted that no assessment has been made of the efficacy of the various conservation initiatives cited, especially those with a human dimension, where it may be difficult to measure changes in human behaviour. More often the case, however, conservation initiatives fail to include this vital monitoring and assessment component as an essential ingredient of their work.

3. Initiatives to facilitate alternative livelihoods

In most IOSEA Signatory States, at least some initiative to facilitate alternative livelihoods could be identified in the published literature and in IOSEA National Reports, with the exception of **Bahrain**, **Cambodia**, **Eritrea**, **Maldives**, **Saudi Arabia**, **United Arab Emirates, United Kingdom** and **United States**. Bahrain and Saudi Arabia have specified in their respective reports that there was no livelihood dependency on turtle exploitation on their territories. Thought not stated explicitly, this finding might apply also to the United Arab Emirates and the United Kingdom; while the United States declared in its report that it was pursuing a regulatory approach rather than a "re-incentive" approach[17]. Although a majority of countries (21) used indirect incentives to facilitate alternative livelihoods for local communities, eight IOSEA Signatory States also created direct incentives by employing local communities for turtle conservation activities.

3.1 Direct incentives: employment of local stakeholders in turtle conservation programmes

Although the wide-ranging, migratory nature of marine turtles is not an incentive to develop payment initiatives for their conservation (Ferraro 2005), NGOs were found to be the main actors that employed local people for various turtle conservation tasks, including monitoring, research and by-catch mitigation.

Beach monitoring and patrolling, including nest protection, was the main activity found to have provided income to coastal communities. The reporting of this kind of activity in nine IOSEA countries – primarily Indonesia and Kenya – almost certainly under-represents the actual situation. In **Indonesia**, coastal community members were hired as beach guards in Bali and on the Derawan Islands from 2001 to 2006 as part of the governmental cash incentive programme (Ferraro & Gjertsen 2009); in Jamursba Medi**,** Papua, by WWF-Indonesia since the 90s – providing alternative income to 40% of local households (Gjertsen & Hitipeuw 2006); and on Sangalaki Island (East Kalimatan) by the owners of the Sangalaki Dive Lodge between 2000 and 2002 (Ferraro & Gjertsen 2009). All of these initiatives were inconclusive and terminated in their early stages. In **Kenya**, employment schemes were implemented by the NGO Lamu Marine Conservation Trust (LAMCOT) from 2008 to 2010 in Lamu (LAMCOT 2010), by the Watamu Turtle Watch (WTW) programme of the Local Ocean Trust (LOT) since 1996 (Church & Palin 2003); and by the Kiunga Marine National Reserve Conservation and Development Project (Ferraro 2007). Comparable employment schemes were reported in **India,** since 2002 (and still as of today) by the TREE Foundation and since 2004 by the Visakha Society for Protection and Care of Animals (VSPCA 2013). Other examples hail from **Kenya** by the Baobab Trust in Mombasa as of 2010 (Baobab Trust 2010); and **Papua New Guinea** by the Western Pacific Regional Fisheries Management Council (WPRFMC) in the 2000s, diminishing their reliance on harvesting leatherback turtle eggs for income as of 2005 (Kinch 2006).

[16] Source: IOSEA Tanzania National Report.
[17] Source: IOSEA United States National Report.

A project in Mafia Island (**United Republic of Tanzania)** run by the SeaSense NGO had recruited 60 community members as "Conservation Officers" as of 2012 and trained them in sea turtle conservation techniques, allowing them to release 225,000 green and hawksbill hatchlings to the sea[18] (Sea Sense 2012). Some programmes have specifically employed former egg poachers for beach patrolling in order to reduce the level of egg harvest, such as in **India** as of 2012 by forest department in Odisha; in **Indonesia** since 2007 by the NGO Yayasan Pulau Banyak[19]; in **Southeast Madagascar**, where as of 2004 egg collectors were reportedly paid twice the per-egg market price to leave nests intact (Rakotonirina *et al*. 2004); in **Malaysia** between 1993 and 2005 by the Sea Turtle Research Unit (SEATRU) – although budget constraints had kept payments lower than market prices (Ferraro 2007), in the **Philippines** since 2005 by the public authorities of Zambales (EPAFI 2005),and in **Sri Lanka** (at Rekawa) as at 2009 – 2011 by the NGO Turtle Conservation Project (TCP) (Kapurusinghe 2012; Ekanayake *et al*. 2002).

Paid conservation duties other than beach patrolling have been entrusted to fishermen and turtle users to help mitigate impacts on turtles. For instance, since 2002 turtle rescue jobs have been offered to eight local **Vietnamese** fishermen in the Bai Thit Turtle Station, with the support of WWF. Although this initiative appears to have been effective for marine turtle conservation (50,000 hatchlings were reportedly returned to the sea over one decade), its performance in developing sustainable alternative livelihoods appears more limited, considering the fact that one month income granted to rescuers was equivalent to a single night fishing. Additionally, former turtle hunters have been employed by the **Australian** government for ghost net collection under the "Carpentaria Ghost Nets Programme"; and for marine debris collection and tagging under the "Australian Government Working on Country" project[20]. The latter has already employed 600 full-time Indigenous rangers for all its activities including marine turtle conservation, and has committed to reach 730 Indigenous rangers by June 2015. The potential for payment incentive schemes in the reduction of bycatch and hunting pressures on turtles would deserve further investigation (Ferraro & Gjertsen 2009).

Finally, a **French** initiative in the Southwest Indian Ocean is noteworthy where, in Mayotte, the sale of affordable meat substitutes such as chicken was initiated in 2010 as an alternative to turtle meat consumption[21], but the efficacy of this measure could not be evaluated. Similarly, Conservation International facilitated pig breeding in Ayau Islands, **Indonesia** in 2007 as a replacement for turtle meat; the project reportedly achieved a reduction in turtle harvest of 80-100 turtles that normally would be consumed for the Christmas feast (Gjertsen & Niesten 2010).

In general, the adoption and the effectiveness of direct incentives such as the employment of local people in turtle conservation activities have been problematic in some contexts (Kinch 2006). The first obstacle typically found is the lack of sustained local opportunities for investment or employment: when funding is no longer available, conservation activities automatically cease hence the implementation of direct incentives is often dependent on endowed or trust funds. Secondly, limited experience of legal contracts among local communities can impair their enforcement and sometimes lead to financial irregularities. Lastly, potential social conflict may arise from the accumulation of prestige of a particular group when equity issues are not properly addressed, apart from the fact that the implementation of direct funding schemes may prevent the adoption of long-term community incentive agreements of benefit to the whole community. All these reasons may contribute to explain why *indirect* incentives have been the most common option adopted in IOSEA countries to facilitate alternative livelihoods among coastal communities.

[18] The mean total payment per nest in 2004 was about 4 USD, to be compared with a casual laborer daily wage of 0,6 USD (Ferraro 2007) resulting in a drop of poaching rate from 100% prior to 2001 to 1,6% in 2008 (Gjertsen & Niesten 2010).

[19] Source: IOSEA Indonesia National Report.

[20] Source: IOSEA Australia National Report.

[21] Source: IOSEA France National Report.

3.2 Indirect incentives to facilitate the conversion of turtle-users to alternative activities

Overall, indirect incentives were found to have been initiated equally by both the public and private sectors, often working in synergy. The most common indirect approach to create alternative livelihoods, reported in more than 15 Signatory States, appears to be support for the conversion of local fishermen, turtle hunters and egg collectors towards various activities that are neutral to marine turtle populations. Such alternative activities were found to range from aquaculture to beekeeping, through agricultural, forest or horticultural activities and handicraft production, in addition to non-turtle-based ecotourism.

Opportunities to replace former consumptive uses of turtles with non-consumptive use, typically through turtle-based ecotourism, were identified in fewer countries (eight). These included mostly turtle watching, but also a few records of homestays in sites frequented by turtles, such as in **Kenya** by the KESCOM-supported "Funzi Turtle Club" as of 2010, in **Madagascar** under the Blue Ventures "Velondriake Ecotourism Plan" since 2008 and in **Malaysia,** organised by the NGO HOPE. Turtle watching has developed significantly around the Indian Ocean since 1995 (Tisdell & Wilson 2003), with this type of ecotourism enterprise reported in nine IOSEA Signatory States. This probably understates the extent of the actual situation. Among the most successful examples, reported in some detail, include the Mon Repos Beach in **Australia**, with 25,000 visitors a season, and **Oman**'s well-frequented visitor centre at Ras al Jinz. Turtle ecotourism has also generated income in **Indonesia**[22]**, Malaysia, Mozambique** (through a programme run by Pierre Lombard since 1999[23]), **Pakistan**[24]**, South Africa** with support of WWF, and in **Tanzania** since 2001 where Sea Sense is donating half of the revenue generated to local communities via 'Village Environment Funds'. Currently, ecotourism projects focusing on marine turtles are being developed particularly on the Turtle Islands as part of the Brunei Darussalam - Indonesia - Malaysia - Philippine East ASEAN Growth Area's (BIMP-EAGA) environment programs, and in several locations in Indonesia where the tourism market is expected to grow by 14.2 percent next year.

Four main indirect incentives were used by IOSEA Signatory States to create alternative livelihoods: training for new skill development; assistance in the establishment of ecotourism groups and consortiums; financial compensation of artisans or egg collectors following a ban in turtle trade; and provision of loans or subsidies.

3.2.1 Skills transfer

The most widespread type of indirect incentive, identified in ten IOSEA Signatory States, is the transfer of new skills to former fishermen and poachers. Those initiatives were carried out by NGOs in practically all cases, with such training requiring less money and more expertise than financial support. The most common type of training provided has been in ecotourism, sometimes leading to professional certification. It has been the case in seven countries, namely **Indonesia** (from 2005 to 2006 by WWF in Bali)[25], **Sri Lanka** (as part of the Turtle Conservation Project), **Thailand** (since 2012 by Naucrates on Phra Thong Island), **Vietnam** (from 2007 to 2009 by WWF in Con Dao National Park), **Yemen** (from 2009 to 2013 by the government), **Madagascar** (since 2002 by ReefDoctors) and **Iran** (since 2012 by local authorities). Other types of training were found in **Bangladesh** (horticulture, fish processing and fishing from 2001 to 2007), **India** (honeybee keeping and net mending for 80 fisherwomen), **Indonesia** (cooking by Yayasan Pulau Banyak since 2007),

[22] Source: IOSEA Indonesia National Report.
[23] Source: IOSEA Mozambique National Report.
[24] Source: IOSEA Pakistan National Report.
[25] Source: IOSEA Indonesia National Report.

Philippines (micro-entrepreneurship on Turtle Islands by WWF in 2004) and **Seychelles** (various types of training under the governmental "Hawksbill Artisan Training and Compensation Project" initiated in the mid-1990s).

3.2.2 Alternative income-generating activities

Financial support for the development of alternative income-generating activities was identified in nine countries. In the past, **Sri Lanka** had a well-established programme through the TCP which facilitated the funding of a library to employ community members, a Batik production facility in Rekawa funded by SCOTIA-USAID, as well as kiosks in Tangalle by MercyCorps. The "RUK Turtle Conservation" loan-assisted project led by IUCN-Sri Lanka from 2000 to 2006 helped to establish occupations as varied as chicken farming, clothes retailing and mechanic repair, although this initiative was rated unsatisfactory (UNDP 2007). Many initiatives also took place in **India**, such as the distribution of vegetable seeds by APOWA in 2001, and of 5,000 fruit trees by the Green Life Rural Association in 2007 and 2008. Additionally, the World Bank-funded Integrated Coastal Zone Management Programme (ICZMP) aimed to provide livelihood assistance to coastal fishermen, albeit with poor implementation. Other significant projects providing financial support for conversion were conducted in **Bangladesh**, through the 'Empowerment of Coastal Fishing Communities for Sustainable Livelihoods Project" (ECFCP) led from 2001 to 2007 by UNDP/FAO; in **Mozambique**, where a vegetable farm was funded at Olumbe by the Zoological Society of London; in **Madagascar**, where the Velondriake Association (Blue Ventures) provided financial and material support for 195 students in academic year 2012-2013; in the **Philippines**, where sea crab traps were provided to fisherfolk in Taganak, Turtle Islands (Basintal 2013); and in **Viet Nam**, where the Con Dao Islands Region Conservation Trust Fund has allowed the recruitment of 20 fishermen to replant 40 ha of coral reef since 2003. As for ecotourism promotion, the government of **Comoros** provided funding in 2001 to facilitate the construction of ecotourism lodges in the Mohéli Marine Park by four community development associations, including ADSEI in Itsamia. In **Jordan,** the Royal Society for the Conservation of Nature created a campsite on the shores of the Dead Sea.

Farming of sea turtles, once considered as another form of non-consumptive use of turtles, at least theoretically, is nowadays not economically viable or sustainable considering the current CITES restrictions on export of turtle products, and indeed, no farmed turtle products are being exported as of today around the Indian Ocean. However, experiments in farming hawksbill turtles were initiated at Crocodylus Park in Darwin (**Australia**).

3.2.3 Organisational support

Support for the establishment of associations, management groups and consortiums, is a third type of indirect incentive provided in IOSEA countries to facilitate alternative livelihoods for coastal communities. It was reported in five countries, with **Madagascar** standing out with the creation of several autonomous associations since 2007. For example, ReefDoctor helped create the FI.MI.HA.RA fishermen group in 2007, whose management of the "Massif des Roses" marine reserve was reportedly providing them with a profit of about £4,000 per year as at 2011; ReefDoctor also successively created two Women's Associations in 2007 and 2010 to engage local women in arts and crafts manufacture. Since 2008, the Velondriake Association (supported by Blue Ventures) has implemented its Velondriake Ecotourism Plan to establish a tourism association and a diving centre, as well as to set up a monetary system. Likewise, a Women's Association was founded in Mozambique in 2007 by the Zoological Society of London on Vamizi Island. In **Kenya**, in former times, KESCOM supported the creation of several Turtle Conservation Groups (TCGs) intended to undertake various income-generating projects such as handicrafts, homestays, crab culture, snake farming and guided boat trips. In **Mauritius**, Shoals Rodrigues supported the creation of the Ocean

Tribe Association which set up a glass-bottom boat business, and created the Association Pêcheurs de Rivière Banane intended to run a husbandry project. In the past, TCP in **Sri Lanka** formed a consortium of Community-Based Organizations (CBOs) in various areas such as fish breeding, sewing, bee keeping and agro-farming, and this network was later linked to relevant government institutions, local businesses and international organizations for training, business links and marketing opportunities.

3.2.4 Financial compensation

Compensation of former artisans / egg collectors following a ban in turtle trade, and of fishermen to help them reduce their activity during a fishing closure, is another indirect incentive reported to have been used in the past in four countries. In **Seychelles,** the governmental Hawksbill Artisan Training and Compensation Project provided $ 15,000 per artisan from 1993 to 1994. Though not of a similar nature or purpose, in **India** the government has begun providing fishermen with 25 kg rice every month priced at only Rs 1 per kg during fishing closures, under the so-called Rice for Olive Ridley Conservation scheme which is meant to partially compensate them for their inability to fish. In **Indonesia**, WWF collaborated with SEACOLOGY in 2005 to provide 13 three-year scholarships for village students (worth USD 23,000) in exchange for establishing a 280 acre no-take leatherback turtle nesting beach, with reportedly successful results (Gjertsen & Niesten 2010).

However, in most cases the effectiveness of these and other initiatives warrants closer scrutiny before they may be considered as models suitable for adoption or adaptation elsewhere. For example, the government-sponsored training undertaken on St Martin Island in **Bangladesh** from 2001 to 2004 was subsequently evaluated as inconclusive[26]. In Seychelles, compensation of artisans was not conditional on performance (Ferraro & Gjertsen 2009) and Mortimer (2004) reported that sales on the black market were still widespread after that measure was put in place. **India**'s ICZMP has not been fully implemented and its heavily subsidised rice scheme is reportedly considered insufficient to address the losses faced by fishermen following the fishing ban in Gahirmatha. Besides**,** income generated from alternative activities does not necessarily or automatically benefit the local community. For instance, income from turtle watching activities in one programme in **Mozambique** is reportedly used to finance the Matutuine turtle monitoring programme, rather than directly supporting local communities which might otherwise have difficulty making ends meet without exploiting marine turtles[27]. Finally, turtle-based ecotourism without appropriate awareness, guidelines or supervision, can sometimes lead to negative effects (Tisdell & Wilson 2003).

4. Involvement of local stakeholders in marine turtle conservation

4.1 Fishermen

Involvement of fishermen in conservation activities was reported in most IOSEA countries over the past two decades, apart from **Mauritius**, **Oman**, **Papua New Guinea**, **Saudi Arabia**, **United Arab Emirates** and **United Kingdom.** They have mostly been involved in initiatives to mitigate turtle – fisheries interactions, in almost all States, but also in data collection (in 15 countries). With some notable exceptions where NGOs have played an important role in engaging fishers in turtle conservation, governments seem to have a strong influence on fisherman involvement. They have done so in 20 out of the 33 countries reviewed.

[26] Source: IOSEA Bangladesh National Report.
[27] Source: IOSEA Mozambique National Report.

4.1.1 Involvement of fishermen in mitigation of fisheries-turtle interactions

Various approaches are used among IOSEA countries whereby fishermen contribute directly to mitigating their impact on marine turtle populations.

Firstly, fishermen have provided input to policy-making related to the conservation of marine turtles, or have been involved in habitat management, in nine countries. In some parts of **Madagascar**, perhaps more than elsewhere, fisher communities have become genuine managers of many marine reserves since the mid-2000s. For instance, the FI.MI.HA.RA association is managing the 'Massif des Roses' marine reserve since 2007, local fishing communities manage the Belo-sur-Mer extension of the Kirindy-Mite National Park created in 2011, and the same scenario is expected by 2015 in the Barren Islands. Moreover, the "Groupement des Aquaculteurs et Pêcheurs de Crevettes de Madagascar" (GAPCM) has also been involved in the 2006 National Task-force for the promotion of the use of TEDs. Elsewhere, fishermen have been involved in the management of the Marine Park of Mayotte[28] in **France** since 2010 and of the Con Dao National Park in **Viet Nam** since 2007**.** In the **Philippines**, management agreements were signed with fishermen to have them refrain from destructive and illegal means of fishing in exchange for loans, but with limited results. In **Mozambique**, local fishermen from Vamizi Island and Olumbe are strongly involved in two Community Fisheries Councils (Concelho Comunitario de Pesca, CCPs) since 2006 to manage marine resources. Additionally, fishing communities in other countries have taken part in the drafting of national or local conservation action plans for marine turtles and their habitats. Examples can be cited from **Thailand** (every year from 2006 to 2008), **Comoros** in 2007 and 2008, **Myanmar** (every year from 2006 to 2008), and **Yemen** from 1997 to 2001 under the Socotra Biodiversity Project.

Secondly, Fishery Improvement Projects (FIPs) are ongoing in eight countries, namely **India**, **Indonesia**, **Vietnam**, **Mozambique** (carried out by WWF), and **Indonesia**, **Philippines**, **Sri Lanka** and **Thailand** (carried out by Sustainable Fisheries Partnership). FIPs are projects that aim to improve a fishery by pressing for better policies and management in order to reduce problems such as illegal fishing, by-catch and habitat loss, through a collaborative alliance of buyers, suppliers and producers.

Thirdly, training in sustainable fishing practices, most often on the use of TEDs, but also in identification of sea turtles, safe handling and release techniques, was reported in seven countries. Notably in **Bangladesh**, 1,000 fishermen were trained during the 2006 IOSEA Year of the Turtle, followed by more training provided by CARINAM in 2009-2010 and by the Bangladesh Center for Village Development in the period 2002 – 2011[29]. Other countries where such training was organised include: **Australia**, **Indonesia**[30]**, Madagascar** (with the assistance of IFREMER)[31], **Philippines** (in 1997 - 1998, but reportedly no positive results), **South Africa** (iSimangaliso National Park), and in **Pakistan** (by IUCN in 2010). Besides, the direct distribution of de-hookers, line cutters, TEDs, circular hooks or properly sized fishing nets to fishery operators was organized in at least five countries, most often by governments. Those countries are **Australia** (since 2009)[32], **India** (undated in Orissa)[33], **Kenya** (in 1997), and the **Philippines**[34] (since 2009 but with poor results).

Rewards or cash incentives given to fishermen who release turtles caught accidentally were reported in four countries. In the **Philippines**, as previously mentioned, WWF-Philippines granted loans to fishermen in the Turtle Islands from 1999 to 2004, on condition that the beneficiaries refrain from destructive and illegal means of fishing and participate in various conservation activities (WWF

[28] Source: IOSEA France National Report.
[29] Source: IOSEA Bangladesh National Report.
[30] Source: IOSEA Indonesia National Report.
[31] Source: IOSEA Madagascar National Report.
[32] Source: IOSEA Australia National Report.
[33] Source: IOSEA India National Report.
[34] Source: IOSEA Philippines National Report.

2005a). Another type of cash incentive was practiced in **Kenya,** where fishermen have been given 3.50 USD per turtle released under the LOT:WTW Bycatch Release Programme over the past 15 years[35], allowing some 9,015 turtles to be released (Oman 2013), and in **Mozambique** where the reward was 4 USD per turtle (Garnier & Silva 2007). In **France**, fishermen who bring back accidentally caught turtles are given a T-shirt and free admission to Kélonia (turtle observatory)[36], apparently with conclusive results since 56 animals were retrieved between 2007 and 2011 (Dalleau *et al*. 2013).

Australia stands out as a model for encouraging fishermen to play a role in marine turtle conservation. From 1999 to 2013, the SeaNet programme led by OceanWatch Australia, with participation of 40% of all commercial fishers, has effectively reduced accidental capture and by-catch of marine turtles. Local fishermen have been involved in beach and coastal clean-ups, hands-on workshops, sea trials of new measures and gear, as well as cooperatively producing best practice technical guides and handbooks and fishery-specific Environmental Management Systems, Codes of Practice and Codes of Conduct. Also in Australia, financial support from a $14.5 million fund was granted to fisheries in 2012 to gain sustainability certification, thanks to a partnership with the Western Australian Fishing Industry Council. Elsewhere, the above-mentioned approaches have not necessarily achieved the same degree of uptake. For instance, resistance from the fisheries industry was reported in **South Africa**[37].

4.1.2 Involvement of fishermen in data collection

Fishermen were found to have contributed to data collection in 15 countries through various approaches over the past two decades.

Firstly, national on-board observer programmes were implemented in the following nine countries – sometimes by the fishermen themselves after adequate training: **Australia**, **France**, **Indonesia**, **Iran**, **Kenya**, **Madagascar**, **Mozambique**, **Seychelles** and **South Africa**. Moreover, **Bahrain** made it compulsory for fishermen to file daily reports of fishing activities and number of turtles caught[38].

Secondly, and perhaps more importantly, fishermen have provided inputs to bycatch studies and tagging programmes in seven countries, sometimes very effectively. In **France**, an activity instigated under the regional Southwest Indian Ocean Fisheries Project (SWIOFP) serves as an example of best practice, whereby 18 accidentally-caught turtles were released by longliners between 2007 and 2011 after tagging with a location/depth recorder satellite tag. Likewise, the 2003 PERSGA tagging programme in **Jordan** could not have been implemented without the help of fishermen bringing animals found in their catch[39]. In **Madagascar** the WWF-led "Malagasy Shrimp Fisheries Aid in Turtle Monitoring" programme in Nosy Iranja has organised, since 2003, the tagging of turtles caught as by-catch by prawn trawlers, in collaboration with the GAPCM. In **Mozambique**, from 2005 to 2007, local fishers from the Primeiras and Segundas Islands brought in 111 turtles to be tagged and released as well as recaptured 25 previously tagged turtles, under the programme led by the Marine Turtle Working Group. Smaller-scale initiatives were undertaken in **Bangladesh**, where fishermen who provided information to MarineLife Alliance for a by-catch study that ran from 2006-2007 were given T-Shirts; and in **Cambodia**, where a compensation system was also put in place to encourage fishermen to share data[40]. Finally, in **Myanmar**, the Department of Fisheries reportedly allows small-

[36] Source: IOSEA France National Report.
[37] Source: IOSEA South Africa National Report.
[38] Source: IOSEA Bahrain National Report.
[39] Source: IOSEA Jordan National Report.
[40] Source: IOSEA Cambodia National Report.

scale fishermen to fish without license if they volunteer information of value for conservation purposes.

Furthermore, voluntary surveys of fishermen with no economic incentive were used **Tanzania**, where beach surveys and interviews with local fishers conducted by Sea Sense NGO in 2011 helped to identify turtle nesting beaches (Muir & Abdallah 2001). Finally, a call line system intended for fishermen was apparently set up by COBEC **in Kenya** in 2009, but no information on its implementation could be found.

4.2 Educational sector

The educational sector was reportedly assimilated into the marine turtle conservation effort in all IOSEA Signatory States but five, namely **Bahrain, Cambodia, Iran, Saudi Arabia** and the **United Kingdom** (BIOT**)**. The creation of eco-clubs to foster pupil participation is an interesting approach used in seven countries, including **Eritrea** (in Assab), **India**, **Jordan** in 2006, **Kenya** in 1998, **Malaysia** in 2010, **Mauritius** (undated), and **Seychelles** from 1989 to 1998.

4.2.1 Incorporation of marine turtle conservation issues in the school/university curriculum

In the recent past, schools and universities in 18 countries were found to have taken up the cause of turtle conservation, mostly by providing lectures about sea turtles. For instance marine turtles are a compulsory component of national school programmes in **Seychelles**[41]. **South Africa** has developed the concept of eco-schools, where community conservation officers work with teachers at 10 schools in and around the iSimangaliso National Park, with marine turtles used as a flagship to introduce different concepts across disciplines as varied as mathematics and geography[42]. Other relevant examples in schools include the **Australian** Reef Guardian Schools Program (reaching 114,900 students); the MarineLife Alliance educational programme in **Bangladesh** in 2006 (746 students); the C3 / PMM initiative in **Comoros** in 2007 (313 students), ReefDoctor's school education programme in **Madagascar** since 2004 (7 public primary schools, 900 children); and Blue Ventures' Saturday Schools environmental lessons (also in Madagascar); as well as IUCN's programme in **Viet Nam** in 2012 (reaching 1,500 pupils). Similarly, the topic of sea turtle conservation has been introduced to schools in **Indonesia** since 2011 by the Sea Turtle Foundation programme and since 2001 by Yayasan Pulau Banyak[43]; in **Kenya** by LOT:WTW since 1998; in **Mozambique** through the 2004 Trade of Marine Protected Species campaign by WWF[44]; in **Thailand** by Naucrates from 1996 to 2012; and in the **United Arab Emirates** since 2010. Furthermore, three countries have incorporated marine turtle conservation issues in their university programmes, namely **Indonesia** (University of Udayana in Bali and Bogor Agricultural University)[45], **Myanmar** (Ayeyarwady Yangon University) and **South Africa** (Nelson Mandela Metropolitan University).

In recent years, the topic of marine turtle conservation has also been introduced in the school curriculum through more and more interactive and creative initiatives, some of which were developed especially for the IOSEA 2006 Year of the Turtle Campaign. Such activities include the redaction of a fictional children's story (**Australia** - 2006), arts competitions (**Australia**, **Comoros** (2006), **Malaysia** (2013) by WWF, **Seychelles (**2008) by the Marine Conservation Society Seychelles[46], **Tanzania** since 2001 by Sea Sense[47]; and **Viet Nam** (2011)), drama, songs and poetry writing

[41] Source: IOSEA Seychelles National Report.
[42] Source: IOSEA South Africa National Report.
[43] Source: IOSEA Indonesia National Report.
[44] Source: IOSEA Mozambique National Report.
[45] Source: IOSEA Indonesia National Report.
[46] Source: IOSEA Seychelles National Report.
[47] Source: IOSEA Tanzania National Report.

(**Kenya** - 2006), as well as school trips to nesting sites (**Pakistan**[48], **Thailand** by Pure Blue Foundation, and **Yemen** in 2006).

4.2.2 Active participation in conservation, awareness-raising and data collection

Public schools appear to have played an active role in conservation in at least eight countries around the Indian Ocean. Schools were found to have been involved mostly in beach clean-up (six countries), with a peak of participation observed during the UNEP Clean-Up the World international campaign. It has been the case in **Australia** since 2003, as part of the Shark Bay Turtle Programme, as well as the Reef Guardian School Program (currently involving 293 schools and more than 114,900 students and 7280 teachers); in **India** (since 2008) fostered by the NGO APOWA and other local groups; in **Jordan** from 2005 to 2010, facilitated by JREDS; in **Kenya** every year under NGO projects organised by LAMCOT and COBEC; in **Oman** every year since 2009 during the Masirah Festival organised by the Environmental Society of Oman (ESO); and in **Sri Lanka** from 1996 to 2000, encouraged by TCP[49]. Other activities include nest protection, in **India** in 2010 by Green Habitat, as well as marine turtle and nest adoption schemes, in **Malaysia** (since 1998 by Universiti Malaysia Terengganu)[50].

The education sector was also reportedly involved in turtle-related data collection in seven countries of the IOSEA region. For instance, university graduates were employed as observers on board fishing ships in **Eritrea** in 2009. In addition, some research activities were conducted by undergraduates as part of their academic curriculum, predominantly in **Indonesia** from 2008 to 2012 by 28 undergraduates from the State University of Papua (UNIPA), with submission for publication in a peer-review scientific journal; and in **India** since 1988 with students from Chennai[51]. Students also sponsored tagged turtles in **Australia** in 2004 and in La Réunion (**France**) from 2008-2011. Finally, schoolchildren participated in satellite tagging in **Oman** in 2011 through a project led by ESO.

Specific awareness-raising activities by teachers, school kids and university students were reported in only three IOSEA countries. In **India** school eco-club rallies including drama and dance shows were conducted in 2006, and a street play was performed by student volunteers from the colleges of Arts & Crafts and S.R.M. College in 2004 at the initiative of the TREE Foundation. Workshops for fishermen were led by school teachers and students in **Bangladesh** in 2006, and an itinerary exhibition was prepared by school children from 2009 to 2011 in **Mauritius** under the Forever Blue project.

4.3 Private sector

Private sector involvement in marine turtle conservation over the past two decades was reported in 16 countries, notably in **Malaysia**. Private sector activity appears to have been most often voluntary, but in some cases it was also encouraged by public authorities, such as in the case of participation in national committees for marine turtles. Donations represent just a limited fraction of this private sector involvement, which has taken various other forms in IOSEA countries, such as conservation actions "in the field", participation in management activities, awareness-raising and data collection.

Private sector actors with past involvement in marine turtle conservation activities in the IOSEA region have included: hotels and resorts in **France** (Mayotte), **Indonesia**, **Malaysia**, **Maldives**, **Oman**, **Sri Lanka**, **Thailand** and **Tanzania;** aquariums in **Australia**, **Malaysia, United Arab**

[48] Source: IOSEA Pakistan National Report.
[49] Source: IOSEA Sri Lanka National Report.
[50] Source: IOSEA Malaysia National Report.
[51] Source: IOSEA India National Report.

Emirates, and United States; fishing industry councils and other private consortiums in **Mozambique**, **Philippines** and **Comoros;** multinational firms in **Jordan**, **Oman** and **Kenya;** local consultancy firms in **Australia** and **Indonesia;** tour operators in **Malaysia;** diving clubs in **Bangladesh;** shop owners in **Mozambique** and private island landowners in **Seychelles**. The list is certainly not exhaustive.

4.3.1 Voluntary and autonomous implementation of conservation actions

Several types of direct conservation activities were performed by actors identified above in no less than 11 countries. The most common activity undertaken by the private sector appears to be support of captive breeding and hatchery programs, with four countries concerned, namely **Indonesia** (by Banyan Tree Bintan Hotel and Resort from 2008 to 2013), **Malaysia** (by the Trekkers Lodge on Pulau Libaran in 2014, by AQUARIA KLCC from 2006 to 2008 and by Melina Beach Turtle Hatchery in 2008), **Maldives** (by Banyan Tree Maldives with tagging of released turtles from 2002 to 2007)[52] and **Thailand** (many privately owned resorts)[53]. Further, clean-up activities were led by the private sector in two countries, **Jordan** (72 volunteers from HSBC in the Clean Up The World Campaign 2006) and **Mauritius** (in 2013 by Forever Blue). This is certainly an understatement of the scope of this activity. Otherwise, beach monitoring has been organized by hotels in **Seychelles** since 2003 (e.g. Banyan Tree Resort) and in **Tanzania** since 2001 (Mnemba Island Lodge). Private aquariums also incorporated turtle hospitals in two countries, namely **Australia** (Reef HQ Aquarium in Queensland since 2009) and the **United Arab Emirates** (by Burj Al Arab Aquarium since 2004). Finally, it was reported that a hotel in La Réunion (Jardin Maoré) voluntarily restricted its sources of light pollution[54].

4.3.2 Participation in law-making and management

In at least four countries, the private sector has participated in National Committees working for the conservation of marine turtles. For example in **Comoros**, the National Committee for Sustainable Development and Environment Issues (CNDD) has included since 2004 the *Fédération des Acteurs pour le Développement Economique et Social de l'Ile de Mohéli* (FADESIM), a consortium of private actors. Similarly, the National Task-force organised in 2006, 2007 and 2008 in **Madagascar** included hotel and tourism stakeholders, as well as a mining enterprise. Local businesses also participated in *ad hoc* meetings held in **Thailand** in 2006, 2007 and 2008 to draft a national action plan; and Lofty Safaris took part in the National Committee on Marine Conservation which met in **Kenya** in those same years.

The private sector has also played a role in marine turtle conservation through its participation in the management of sanctuaries / MPAs in at least five countries. A notable example can be found in **Malaysia**, with the private management of the Sugud Islands Marine Conservation Area in Sabah, by Reef Guardian, since 2001. This case shows that private management of MPAs can be adequate to ensure sustainable funding and enforcement (The, 2008). However, it is also important to note that this example was successful under several conditions: Reef Guardian is a well-institutionalised company created for that purpose; local communities support the company's activities; enforcement support is provided by local regulatory agencies; and fees generated from visitors are sufficient due to the site's diving opportunities. But in the cases where these issues are not properly addressed, social or economic problems may arise (Teh 2008).

[52] Source: IOSEA Maldives National Report.
[53] Source: IOSEA Thailand National Report.
[54] Source: IOSEA France National Report.

Other examples are found in **Indonesia,** where the Bunaken MPA has been privately managed since 1998 by the North Sulawesi Watersports Association, formed by 14 dive operators. There, the business sector was assimilated in the management of several nesting beaches at Derawan, Pangumbahan, Meru Betiri and Jamursba Medi through an MoU contracted with local community groups which defined the funding mechanisms. Private actors have also been involved in MPA management in **Mozambique**, by East African Wildlife (since 2000); in **Tanzania** since 2003 by the Mnemba Island Lodge in the Mnemba Island Marine Conservation Area; and in **Philippines** since 1997, where the Tubbataha Protected Area Management Board includes the private companies SAGUDA-Palawan and Tambuli ta mga Kagayanen, Inc. However, the involvement of private sector in activities such as the management of MPAs can be effective only when it is done in association with local communities in order to match their goals and interests, by ensuring a fair user access to MPA resources (Mascia *et al.* 2003).

4.3.3 Direct sponsorship and crowdfunding

In at least five other countries, the private sector sponsored particular NGO activities, donated directly to NGOs, or helped raise funds. Examples include the sponsorship of Total to a governmental satellite tracking programme in Oman in 2014; the MSCC Turtle Fund constituted in **Seychelles** since 2004; contributions from local business organisations to fund the TCP-Sri Lanka in the past, as well as crowdfunding efforts from an Australian-owned Villa to support the Kosgoda Sea Turtle Conservation (KTSC) project in 2014 in **Sri Lanka**; donations by the Mai Khao Marine Turtle Foundation in 2012 for the Turtle Hatchery Program led by the Royal Thai Navy, and for the Injured Turtle Rehabilitation Program led by the Phuket Marine Biological Center in **Thailand;** and the Socotra Conservation Fund in **Yemen** for the purpose of attracting private funding. This list is certainly not exhaustive.

4.3.4 Turtle awareness-raising initiatives

The private sector proved itself capable of educating the wider public on marine turtle conservation issues in eight countries. The most classical approach, adopted in five countries (**Thailand, Malaysia, Mozambique, Seychelles** and **South Africa**) was the organisation of awareness-raising events. Meaningful examples are found in **Thailand,** where a sea turtle release festival is organised every year by Dusit & Laguna Co. Ltd. and by Le Meridien Hotel in Phuket[55]; and in **Seychelles,** where the Banyan Tree Resort was reported to give educational talks (undated). Further, "Adopt a Turtle" campaigns were organised by private actors in four countries, namely **Malaysia** (in 2007 by AQUARIA KLCC), **Oman** and **United Arab Emirates** (from 2009 to 2011 by Nokia) and the **United States** (in 2009 by UnderWater World Aquarium in Guam). Finally, ecotourism activities (e.g. observation of nesting) are organised by private actors in several countries, such as in **Seychelles** where yacht charter companies reportedly organise trips for tourists to see and feed sea turtles around the islands[56]. In May 2014, a free online training tool was released by the Travel Foundation to help tourism businesses apply best practice standards to become more "turtle friendly".

4.3.5 Involvement in data collection

Since the mid-90s, the private sector was found to have contributed to marine turtle research in five countries, mainly by doing or sponsoring research. For example, satellite tracking studies have

[55] Source: IOSEA Thailand National Report.
[56] Source: IOSEA Seychelles National Report.

been carried out in **Australia** from 2005 to 2006 by Pendoley Environmental Pty Ltd and the **Maldives** from 1994 to 1996 by Vadoo Diving Paradise resort; and some flipper tagging was done in **Mozambique** around 2008 by Pierre Lombard *et al.*[57] and in **Tanzania** since 2001 by Mnemba Island Lodge. In addition, underwater collection of data on turtles has been undertaken by private diving centers in **Jordan**[58]; and blood sampling for DNA studies, parasite identification and treatment are ongoing since 1992 in **Maldives** by Vadoo Diving Paradise.

4.4 Indigenous communities

During the past two decades, the involvement of indigenous communities in marine turtle conservation activities and data collection was reported in all countries except **Cambodia**, **Saudi Arabia** and the **United Kingdom**, and most initiatives were taken in the last ten years. The main actors working towards local community participation through the implementation of community-based programmes were local NGOs, followed by international NGOs (WWF, IUCN, Conservation International) and governmental and private initiatives.

4.4.1 Involvement of local communities in turtle conservation activities

Many community-based conservation programmes implemented in IOSEA countries involved indigenous communities in conservation activities, such as beach cleaning and monitoring, egg relocation, tagging, ghost net collection, and participation in research programmes. Cash incentives were sometimes provided to ensure the engagement of local communities, as in **Kenya** in the 2000s where 500 Ksh (5,80 US$) were provided to local villagers to encourage them to report nests in Kiunga Marine National Reserve (KMNR) (Church & Palin 2003); in the **Philippines** where P5-P6 (0.02 US$) are being offered per egg delivered to turtle hatcheries since 2003 in Zambales; in **Seychelles** where a Save the Turtles T-Shirt is given for each return of turtle tag[59]; in **Tanzania** since 2002 where 3 US$ is given to individuals who report a nest in Mafia Island; and in the **United States** where information providers who report turtle poachers get a 1,000 US$ reward.

Other activities were most often based on voluntary contributions. Original initiatives were taken in 2010 by **France**, with the creation in Mayotte of REMMAT[60], a local intervention network constituted of administrative staff, volunteers and veterinarians to deal with dead or injured turtles. Since 2010, the establishment in La Réunion of a network "The eyes of the lagoon" has gathered precious information from divers who report information on marine turtles identified by photo identification methods, in exchange for free admission to Kélonia[61]. Besides, other successful examples of community-based conservation programmes were found in **Indonesia**, where the Bengkulu Nature Conservation Agency supervises two community groups in Mukomuko district to conduct egg hatching and release (570 hatchlings in 2012); in South-West **Madagascar**, where ReefDoctor recently implemented the first community-based tagging program of juvenile turtles; in **Papua New Guinea**, where the Huon Coast Leatherback Turtle Conservation Project led by the Marine Research Foundation from 2005 to 2012 facilitated the release of over 100,000 hatchlings by the local communities; in **Viet Nam**, where 400 local people attended training provided by IUCN in 2011-2012 to empower them in conservation of marine turtles.

[57] Source: IOSEA Mozambique National Report.
[58] Source: IOSEA Jordan National Report.
[59] Source: IOSEA Seychelles National Report.
[60] Source: IOSEA France National Report.
[61] Source: IOSEA France National Report.

4.4.2 Involvement of local communities in turtle habitat management

Apart from the particular conservation activities described above, examples of community-based management of turtle habitats conducted by local communities are noteworthy. Those experiences, involving indigenous communities to manage their land, appear to be more adapted to respect local communities' interests, while often achieving more sustainability and better equity among community members. Exemplary measures can be found in **Australia**, where two national turtle committees were put in place to create partnerships with indigenous communities to address the sustainable harvest of marine turtles. In the Northern Territory, Queensland, and in north-western Australia more specifically, the recent governmental "Caring for our Country" program (2010-11) has already led to the foundation of nearly 20 Aboriginal and Traditional Owner corporations. "Community Action Grants" are being provided to them to help them engage in sea management activities, employing 300 full-time equivalent Indigenous rangers.

Further afield, in **Bangladesh**, Ecologically Critical Areas have been managed since the 2000s by ECA Coordination Committees, which include Village Conservation Groups that represent indigenous communities[62]. Likewise, the Moheli Marine Park in **Comoros** is based on a participatory governance system involving ten village associations in the General Assembly, representing approximately 10,000 habitants. In **Indonesia**, numerous local Community Conservation Agreements help regulate community activities that may otherwise disrupt nesting turtles and habitats, including bans on domestic pigs and dogs, bans on forest clearing around watershed and nesting beaches, and allocation of no fishing zones. Customary bylaws in Bali have been agreed that include chapters on turtle conservation and protection, and provide for law enforcement activities targeting the turtle traders[63]. Beyond that, a genuine LMMA (Locally-Managed Marine Area) Network was set up in two areas of eastern Indonesia (West Papua and the Moluccas Islands) to promote community-based coastal zone management.

In **Madagascar** as well, about 20 LMMAs have been created since 2004 and the implementation, support for and monitoring of "*Dinas*" (community agreements) for the conservation of turtles is ongoing. In the **Philippines,** since 2004 the "Memorandum of Agreement for joint management of the Turtle Islands" allows the Protected Area Management Board to manage the permit system for turtle egg collection, hatcheries, as well as monitoring and enforcement (Basintal 2013). Also, the Philippines LMMA Network introduced Community-Based Adaptive Management for four marine sanctuaries created since 1998. Likewise, in **Papua New Guinea,** conservation deeds are being signed by local communities, such as the one signed by the village of Karkum, which engaged the community not to kill or eat leatherback turtles for 5 years. In **Seychelles**, the Turtle Action Group assembles Government, parastatal organisations, NGOs, private businesses, owners and lease holders of private islands, and hotels, in a loose network for the purpose of data sharing and production of a turtle conservation strategy[64]. National Turtle Committees involving local communities, through NGOs, are also found in **Sri Lanka** since 2005[65] and in **Tanzania** since 2010.

[62] Source: IOSEA Bangladesh National Report.
[63] Source: IOSEA Indonesia National Report.
[64] Source: IOSEA Seychelles National Report.
[65] Source: IOSEA Sri Lanka National Report.

5. Conclusions

5.1 Uneven geographical and thematic distribution of published socio-economic studies

Over the past two decades, socio-economic studies addressing the issues of marine turtle use and conservation have been conducted in the broad majority of IOSEA Signatory States – however unevenly – at local, national, and sub-regional levels. Most studies focused on the impacts of human activities on marine turtles, principally fishing, closely followed by unsustainable use, while the impacts of coastal development and human presence on beaches seem to have been poorly evaluated in the IOSEA region. Studies investigating the socio-economic and cultural implications of marine turtle conservation were identified in only 15 countries, including eight studies focused on turtle-based ecotourism. Research undertaken on a sub-regional level partly compensated for this deficit, with about ten publications resulting from research led by the WIOMSA in the Western Indian Ocean in the late 2000s, and about 15 studies published from interview-based surveys undertaken by the United States Southwest Fisheries Science Center in South-East Asia in the mid-2000s. However, there is still a need to develop social mapping programmes to better understand the human components of marine turtle use and conservation, such as legends, culture and history associated with sea turtles, in order to strengthen the community's support of conservation activities and to improve their efficacy.

5.2 Potential to diversify awareness-raising and education media

In most IOSEA Signatory States, conservationists tended to adhere to classical methods of outreach (involving lectures, production and dissemination of brochures, posters and videos etc). Education / outreach centres dedicated specifically to turtles and the marine environment were found to exist in only a few countries, notwithstanding their potential to communicate a more in-depth conservation message to a large number of visitors. Moreover, an examination of the practices in all countries suggests that approaches can be much more varied and that use of the internet and social media can also be effective tools for reaching the youth. It is hoped that awareness-raising programmes initiated in many countries, especially during the 2006 IOSEA Year of the Turtle campaign, can be sustained and expanded, and that some of the best practices identified above (e.g. in Comoros, Eritrea, Philippines, Pakistan and Tanzania) will inspire new educational practices in other parts of the region.

For all of the methods used to convey information about the importance of conserving marine turtles and the habitats on which they depend, more consideration needs to be given to evaluating their efficacy and impact. All too often, this crucial component is missing from awareness-raising initiatives, leaving no basis for objectively (or even subjectively) assessing whether the investment of time and effort has had any meaningful benefit in terms of turtle conservation.

5.3 Alternative livelihood development

Direct or indirect incentives to develop alternative livelihoods aimed at reducing negative interactions of local communities with marine turtles have been adopted in the majority of IOSEA countries. Yet financial sustainability remains a serious challenge to many projects that are initiated with good intentions, either to engage stakeholders in alternative activities or in turtle-related conservation projects. Turtle-based eco-tourism was identified in only 8 countries – probably an under-estimate of the actual situation – in contrast with a larger number of initiatives to facilitate alternative sources of income that do not use the turtle resource. There is scope for expansion of ecotourism as a sustainable, non-consumptive use of marine turtles that allows for both positive

conservation outcomes and community development, subject to stringent protocols that give priority to environmental protection and assure that revenues are equitably distributed to the custodians of the resource.

5.4 Importance of involving all stakeholders to improve the effectiveness of conservation activities

Successful examples from Australia and elsewhere suggest that involvement of local stakeholders in all aspects of resource management and research – including habitat monitoring, data collection and disposal of marine debris – has the potential to have far-reaching benefits in terms of community engagement and assuming responsibility for the resource.

Fishermen have contributed to turtle conservation throughout the IOSEA region, be it through habitat management, implementation of sustainable fishing practices and training in by-catch reduction and mitigation techniques, as well as voluntary or rewarded release of incidentally-caught turtles. However, the potential for assimilating fishermen into research projects appears to have not been exploited to its full extent, although some success stories prove the efficiency of this practice. Indeed, it presents the double advantage of reducing research costs, while raising awareness and a sense of responsibility among one element of the local population whose activities may have negative impacts on marine turtles.

A review of approaches used to assimilate turtle education into school curricula provides some interesting examples of innovations that have been employed in recent years to reach school children. These have included creative teaching methods and direct participation in conservation activities, all of which serve to raise awareness of turtle conservation issues. Although limited in scope, private sector involvement in conservation programmes can be found in some form in most IOSEA countries, including some notable examples in South-East Asia.

Finally, selected examples of local community involvement in turtle conservation activities as well as habitat management suggest that there are successful programmes across the region that may be suitable for replication or adaptation elsewhere. This process of knowledge / experience transfer would benefit from standardised documentation of methodology, as well as objective evaluation of successes and failures, implementation challenges and lessons learned.

Appendix 1. Glossary of selected abbreviations

ADSEI	*Association pour le Développement SocioEconomique d'Itsamia* (Comoros)
CARINAM	Centre for Advanced Research in Natural Resources & Management (Bangladesh)
CEDTM	*Centre d'Étude et de Découverte des Tortues Marines* (La Reunion, France)
CI	Conservation International
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COBEC	Community-Based Environmental Conservation (Kenya)
ECAs	Ecologically Critical Areas (Bangladesh)
ESO	Environmental Society of Oman
FAO	Food and Agriculture Organisation
FI.MI.HA.RA	*FIkambanana MIaro sy HAnasoa ny RAnomasina*, Local fishermen Association to Protect and Enhance the Marine Environment (Madagascar)
FIPs	Fishery Improvement Projects
GAPCM	"*Groupement des Aquaculteurs et Pêcheurs de Crevettes de Madagascar*"
ICZMP	Integrated Coastal Zone Management Programme (India)
IOSEA	Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia
IOTC	Indian Ocean Tuna Commission
IUCN	International Union for Conservation of Nature
KESCOM	Kenya Sea Turtle Conservation Committee (Kenya)
LAMCOT	Lamu Marine Conservation Trust (Kenya)
LMMA	Locally-Managed Marine Area
LOT	Local Ocean Trust (Kenya)
MPA	Marine Protected Area
NGO	Non-Governmental Organisation
PERSGA	Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden
PRA	Participatory Rural Appraisal
REMMAT	*Réseau Echouage Mahorais de MAmmifères marins et de Tortues marines* (Mayotte, France)
SWIOFP	Southwest Indian Ocean Fisheries Project
TCP	Turtle Conservation Project (Sri Lanka)
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VSPCA	Visakha Society for Protection and Care of Animals (India)
WIO	Western Indian Ocean
WIO-MTTF	Western Indian Ocean - Marine Turtle Task Force
WIOMSA	Western Indian Ocean Marine Science Association
WTW	Watamu Turtle Watch
WWF	World Wide Fund for Nature

Appendix 2. Bibliography

The following bibliography is organised in two sections, each sub-divided by country or other regional grouping. Part I lists studies cited in the synthesis paper that address resource use by coastal communities, economic value of turtle products, and socio-economic and cultural implications of marine turtle use and conservation. Part II lists other reports and descriptions of conservation programmes involving participation of communities that are not cited in the synthesis paper.

Part I

Australia

■ Buchanan, G., Altman, J., Arthur, B., Oades, D., Bardi Jawi Rangers. 2009. "Always part of us". The socioeconomics of Indigenous customary use and management of dugong and marine turtles -- a view from Bardi and Jawi sea country, Western Australia. NAILSMA Knowledg series. http://bit.ly/19Y6F5Z. *The report aims to document the socioeconomics - that is - the social, cultural and economic values of, and factors influencing—Indigenous customary use and management of dugong and marine turtles.*

■ Grayson, J. 2011. Characteristics of traditional dugong and green turtle fisheries in Torres Strait: opportunities for management. PhD thesis, James Cook University. http://researchonline.jcu.edu.au/29585/ Publications arising from this thesis are available from the Related URLs field. The publications are: Grayson, Jillian, Hamann, Mark, Marsh, Helene, and Ambar, Stephen (2010) Options for managing the sustainable use of green turtles: perceptions of Hammond Islanders in Torres Strait. Conservation and Society, 8 (1). pp. 73-83.Jones, A., Barnett, B., Williams, A.J., Grayson, J., Busilacchi, S., Duckworth, A., Evans-Illidge, E., Begg, G.A., and Murchie, C.D. (2008) Effective communication tools to engage Torres Strait Islanders in scientific research. Continental Shelf Research, 28 (16). pp. 2350-2356. *To inform the development of management arrangements for the traditional dugong and green turtle fisheries in Torres Strait this study aimed to provide an overall context for management at different spatial scales and investigate opportunities and challenges associated with co-management, particularly community-based monitoring.*

■ Kamrowski RL, Limpus C, Moloney J, Hamann M. 2012. Coastal light pollution and marine turtles: assessing the magnitude of the problem. J Endangered Species Research v19: 1, PP 85-98. http://www.int-res.com/articles/esr_oa/n019p085.pdf. *Authors used geographical information system analysis to over-lay turtle nesting data onto night-time lights data produced by the NOAA National Geophysical Data Center, to assess the proportion of marine turtles in Australia potentially at risk from light pollution. They also identified the Australian nesting sites which may face the greatest threat from artificial light. Their assessment indicates that the majority of nesting turtles appear to be at low risk, but population management units in Western Australia and Queensland are vulnerable to light pollution. The risk to turtles from light generated by industrial developments appears significantly higher than at any other location. Consequently, managers of turtle management units in regions of proposed or on-going industrial development should anticipate potentially disrupted turtle behaviour due to light pollution.*

■ Maethger, L.M., Lohmann, K.J., Limpus, C.J. and Fritsches, K.A. 2011. An unsuccessful attempt to elicit orientation responses to linearly polarized light in hatchling loggerhead sea turtles (Caretta caretta). Philosophical Transactions of the Royal Society B-Biological Sciences, 366:757-762. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3049016/. *This study tested the ability of loggerhead hatchlings to maintain a swimming direction in the presence of broad-spectrum polarized light. At the start of each trial, hatchling turtles, with their magnetic sense temporarily impaired by magnets, successfully established a steady course towards a light-emitting diode (LED) light source while the polarized light field was present. When the LED was removed, however, hatchlings failed to maintain a steady swimming direction, even though the polarized light field remained. Results have failed to*

provide evidence for polarized light perception in young sea turtles and suggest that alternative cues guide the initial migration offshore.

■ Pendoley, K. L. 2005. Sea turtles and the environmental management of industrial activities in north west Western Australia. Doctoral dissertation, Murdoch University, Perth. http://researchrepository.murdoch.edu.au/254/2/02Whole.pdf

■ Nursey-Bray, M. 2006. Conflict to co-management: eating our words - towards socially just conservation of green turtles and dugongs in the Great Barrier Reef, Australia, unpublished PhD thesis, James Cook University, Cairns. http://researchonline.jcu.edu.au/1579/1/01front.pdf

■ Tisdell C, Wilson C. 2003. Does Ecotourism Contribute to Sea Turtle Conservation? Is the Flagship Status of Turtles Advantageous? Working Paper No. 90. "Economics, Ecology and the Environment", December 2003, The University of Queensland. http://ageconsearch.umn.edu/bitstream/48971/2/WP90.pdf. *Particular attention is given to the development of turtle-based ecotourism at Mon Repos Beach near Bundaberg, Australia, and in Sri Lanka, where effects of such initiatives on turtle conservation are uncertain.*

■ Webb, G. J.W., Manolis, S. C., Gray, M. 2008. "Captive Breeding and Marketing of Turtles". RIRDC Publication No 08/012. https://rirdc.infoservices.com.au/downloads/08-012.pdf. *This report provides evidence of the potential viability of turtle industries, both marine and freshwater turtles.*

■ Weiss, K. C. 2011. Towards social-ecological resilience in natural resource governance: issues of power, diversity and scale. PhD thesis, James Cook University. http://researchonline.jcu.edu.au/29239/1/29239_Weiss_2011_thesis.pdf To explore relationships among stakeholders in marine turtle and dugong management more thoroughly, I used social network analysis to depict the various network linkages and institutional structures that link these stakeholders to each other. First I focused on power relations by comparing flows of knowledge and policy influence through the management network. My findings suggested that information exchange in the network is dense and decentralized, while policy power is concentrated in state and national government agencies, creating disconnect between knowledge and decision-making. These results suggest a lack of bottom-up engagement capacity that limits equitable decision-making and sustainable cross-scale collaboration.

Bahrain

■ Abdulqader, E. A. A. 2008. Marine turtle mortality in the waters of the Kingdom of Bahrain: Report of the Dead Marine Turtle Monitoring Program for the last quarter of 2007. Bahrain Center for Studies and Research, pp. 37 (in Arabic). *Report unavailable. In September 2007, the Bahrain Center for Studies and Research (BCSR) began the Dead Marine Turtle Monitoring Programme to monitor marine turtle mortality. Two approaches were adopted: direct examination and recording of cases of dead turtles, including those reported by the public or found by the study team; and conduction of a questionnaire survey. This study revealed that a sharp increase in the number of dead marine turtles coincided with the beginning of the shrimping season, in mid-July.*

■ Abdulqader, E. A. A. 2006. Turtle incidences in shrimp trawl nets during the seasons 1998/99 to 2002/03 in Bahrain's waters. Bahrain Centre for Studies and Research, pp. 24. *Not found on the Web.*

Bangladesh

■ Hasan, M. M. 2009. Tourism and Conservation of Biodiversity: A Case Study of St. Martins Island, Bangladesh." Law, Social Justice & Global Development (An Electronic Law Journal). http://www.thefreelibrary.com/Tourism+and+conservation+of+biodiversity%3A+a+case+study+of+St.+Martins...-a0207350768. *This article addresses the threats to sea turtles in St. Martin's Island and how to assimilate Tourism Management into Biodiversity Conservation.*

■ Islam M. Z. 2005. Impact of coastal development on sea turtle at St. Martin & Cox's Bazar coast and Sonadia Island in Bangladesh; Technical Report. CWBMP. *Report could not be found.*

■ Islam M. Z. 2002. Impact of coastal development on sea turtle at St. Martin and Cox's Bazar coast in Bangladesh; Technical Report. Marine Life Alliance. 25. *Report could not be found.*

■ Islam, M. Z. 2001. Notes on the Trade in Marine Turtle Products in Bangladesh. Marine Turtle Newsletter 94: 10-11. http://www.seaturtle.org/mtn/archives/mtn94/mtn94p10.shtml. A report on the investigation undertaken *by* MarineLife Alliance on the extent of trade in turtle products in Bangladesh.

■ Rahman, M. M. 2006. Marine Turtle Illegal Trade in the Southwest Coastal part of Bangladesh. Centre for Coastal Environmental Conservation (CCEC), Bangladesh. http://www.ioseaturtles.org/bibliography_print.php?id=1840.

Cambodia

■ Lehr E, Holloway R. 2002. Investigations on the turtle and tortoise trade in Cambodia. Reptilia 7(5):62-70. *Unavailable.*

■ Longdy V. 2002. Sea turtle distribution and nesting ground in Cambodia. Proceedings of the 3rd SEASTAR2000 Workshop 121-123. http://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/44171/1/3rdSEASTAR2000_121.pdf. *This report presents the results of a survey interviewing 12 fishermen about sea turtle nesting grounds in the past and present, and about by-catch of sea turtles. Two methods were used for this study: interviews of fishermen who have experienced sea turtle fishing and egg collection along the coastline of Cambodia, and interviews of old fishermen operating in the coastal area.*

Comoros

■ Amande, J. M., A. J., E. Chassot, P. Chavance, A. Delgado de Molina, D. Gaertner, H. Murua, R. Pianet and J. Ruiz. 2008. By-catch and discards of the European purse seine tuna fishery in the Indian ocean. Estimation and characteristics for the 2003-2007 period. IOTC-2008-WPEB-12, 26p. http://www.iotc.org/files/proceedings/2008/wpeb/IOTC-2008-WPEB-12.pdf. *Data collected from the mandatory sampling programme for the collection of data in the fisheries sector (PNDB) under the EU Data Collection Regulation. The data used here cover the whole period since the beginning of programs in 2003 until 2007 and reach a total of 1,958 observed sets (1,162 free school sets, 762 log-school sets, and 34 sets made on seamounts).*

■ C3-Comoros. 2007. Stakeholder's perceptions of Moheli Marine Park, Comoros: lessons learned from 5 years of co-management. C3 Technical Report Series No.4. ISSN 1754-5188. Community Centred Conservation (C3), London, UK. 34pp. http://c-3.org.uk/wordpress/wp-content/uploads/pdf/technical_reports/paper7/C3-Comores_2007_Stakeholders_perceptions_PMM_TRS4.pdf. *20 Interviews (12 questions) were carried out between 10th July 2006 and 20th August 2006 in the 10 villages of PMM. This work aimed to ascertain local stakeholders' current perceptions of PMM, using focus group interviews to evaluate six key parameters: Basic awareness, Value of the PMM, Effectiveness, Environmental threats and solutions, Stakeholder roles and responsibilities, Future aspirations and expectations. Turtle poaching was the most commonly cited threat within PMM.*

■ Lilette V. 2006. Conservation and heritage value of marine turtles in the south west Indian Ocean. Ph.D. thesis, University of La Réunion, Laboratory of Anthropology, 423p. *Unavailable. This comparative study of conservation and heritage of marine turtle between Comoros and south-western Madagascar aims at understanding the process of convergence and divergence leading to the success or failure of projects, and the socio-economic changes they imply on a local scale. The comparison of two monographs, Itsamia (Mohéli, Comoros) and Anakao (South-western Madagascar), aims at presenting the economic stakes induced by marine turtles (through fishing, ecotourism valuation), and the shift that these events imply (valuation or devaluation of the animal).*

■ Moore, J. E., Cox, T. M., Lewison, R. L., Read, A. J., Bjorkland, R., McDonald, S. L., Crowder, L. B., Aruna, E., Ayissi, I., Espeut, P., Joynson-Hicks, C., Pilcher, N., Poonian, C.N.S., Solarin, B. Kiszka, J. 2010. An interview-based approach to assess marine mammal and sea turtle captures in

artisanal fisheries. Biological Conservation, 143(3), 795-805. http://www.sciencedirect.com/science/article/pii/S000632070900531X. *An intensive pilot study to evaluate whether interview surveys can be effective in assessing fishing effort and threatened species bycatch. In-person surveys were conducted during 2007 and 2008 in fishing communities from seven countries: Sierra Leone, Cameroon, Nigeria, Tanzania, Comoros, Malaysia, and Jamaica.*

■ Poonian, C., Whitty, T. Unpublished. Socioeconomic Drivers of SeaTurtle Interactions with Artisanal Fisheries in the Western Indian Ocean Islands. C3. http://c-3.org.uk/fisheries-bycatch-a-major-threat-to-sea-turtles/ *Unpublished report. Bycatch in small scale fisheries is a significant threat to sea turtles in the Indian Ocean. This report addresses ecological and socioeconomic issues in fishing communities in the Comoros, Mauritius and Madagascar. This work has been presented at regional and international symposia and it was expected to lead to the publication of a major paper from this work in late 2013.*

■ Poonian, C. N. S., Hauzer, M. D., Ben Allaoui, A. 2008. Artisanal Bycatch of Turtles in the Union of the Comoros, Western Indian Ocean – Are Gear Restrictions Always Effective? *In* Tacking Fisheries Byatch: Managing and reducing sea turtle bycatch in gillnets. 28th International Sea Turtle Symposium Workshop proceedings, 25 January 2008. Loreto, Baja California Sur, Mexico. http://bycatch.nicholas.duke.edu/publicationsandreports/GloBAL%20ISTS%20Proceedings%202008.pdf *Turtle bycatch in artisanal fisheries in the Comoros was investigated through structured interviews of fishers and a review of existing fishery data. A total of 25 out of 44 landing sites were sampled on Grande Comore and 5 out of 13 sites were sampled on Mohéli (all outside of Mohéli Marine Park).*

■ Poonian, C. N. S. 2008. Rapid Assessment of Sea Turtle and Marine Mammal Bycatch in the Union of the Comoros. Western Indian Ocean J. Mar. Sci.Vol. 7, No. 2, pp. 207–216. http://c-3.org.uk/wordpress/wp-content/uploads/pdf/peer_reviewed_papers/paper4/207-216_Poonian2.pdf . *Between June and August 2007, a total of 409 interviews (200 short and 140 long interviews on Grande Comore; 34 short and 35 long on Mohéli) were conducted out of the estimated 8,500 fishers in the Comoros.*

Eritrea

■ Teclemariam, Y., Weldeyohannes, S., Mengstu, T., Goitom, M. 2006. The Incidental Capture of Sea Turtles in Industrial Shrimp and Fish Trawlers Operating on the waters of the Eritrean Red Sea (1994-2004). *In* Kiszka, J. & Muir, C. (Eds.), 2007. Incidental catch of non-targeted marine species in the Western Indian Ocean: problems and mitigation measures. Workshop proceeding. 13-15th November 2006, Mayotte, France. 111 p. http://www.researchgate.net/publication/235624009_Bycatch_of_non-targeted_marine_species_in_the_western_Indian_Ocean/file/d912f511f8a339dc22.pdf. *Turtle bycatch data recorded by the Monitoring, Control and Surveillance Division of the Ministry of Fisheries. The data, simply analysed by Microsoft Excel, include the date of incidental catch, species, position of catch, depth, time of trawling and condition of the incidentally caught turtles. A total of 3,342 cases of incidentally captured sea turtles were reported during ten years (1994-2004) of recording of fishing trips of industrial shrimp and fish trawlers operating in different fishing grounds of the Eritrean Red Sea.*

France

■ Amande, J. M., A. J., E. Chassot, P. Chavance, A. Delgado de Molina, D. Gaertner, H. Murua, R. Pianet and J. Ruiz, 2008. By-catch and discards of the European purse seine tuna fishery in the Indian ocean. Estimation and characteristics for the 2003-2007 period. IOTC-2008-WPEB-12, 26p. http://www.iotc.org/files/proceedings/2008/wpeb/IOTC-2008-WPEB-12.pdf. *Data collected from the mandatory sampling programme for the collection of data in the fisheries sector (PNDB) under the EU Data Collection Regulation. The data used here cover the whole period since the beginning of programs in 2003 until 2007 and reach a total of 1,958 observed sets (1,162 free school sets, 762 log-*

school sets, and 34 sets made on seamounts). Sets are categorized between log-school sets (FAD), free school sets (FSC) and seamounts sets (MsM) according to direct information given by observers.

■ Claro F., Bedel S., Forin-Wiart, M. A. 2010. Interactions entre pêcheries et tortues marines en France métropolitaine et d'Outre-mer. Rapport SPN 2010/13. MNHN-SPN, Paris, 123 p. http://www.ioseaturtles.org/bibliography_search_detail.php?id=1934. *Not available.*

■ Collet A. & Martin L. F. 2005. Contribution à la faisabilité de réhabilitation d'un site de ponte pour les tortues marines: cas de la plage de Grand'Anse Adeline. Kélonia. http://www.ioseaturtles.org/bibliography_search_detail.php?id=440. *In this feasibility study for rehabilitation of a nesting site, solutions are proposed to limit the problems related to human presence.*

■ Guillem R. 2006. L'exploitation touristique de la tortue marine de Mayotte à la Réunion. Kélonia. *Reference not found on the Web.*

■ Poisson, F. 2007. Incidental and bycatches of sharks and turtles in the Reunion Island swordfish longline fishery in the Indian Ocean (1994-2000). IOTC-2007-WPEB-03, 13p. http://www.iotc.org/files/proceedings/2007/wpby/IOTC-2007-WPEB-03.pdf. *This study is based on data collected between 1994 and 2000 by Ifremer from voluntary logbooks and regular at-sea and port sampling programmes from the Indian Ocean swordfish longline fishery based in La Réunion. During 1996 and 2000, the fishery recorded 97 interactions with turtles: 51 with leatherback, 30 with hawksbill and 16 with green turtles. The catch status of the turtles (alive or dead) when the gear was retrieved varied depending on the species, but in most of the cases, they were released alive. This study underscores the need to conduct experiments to gain information about long-term survival of released bycatch species.*

■ Pusineri, C. & Quillard M. 2008. Bycatch of protected megafauna in the artisanal coastal fishery of Mayotte island. Western Indian Ocean J. Mar. Sci., 7(2): 195–206. http://www.ajol.info/index.php/wiojms/article/view/48277. *Survey in the two local languages conducted among 406 fishermen in 2007 to acquire information on the number of accidental captures, what becomes of the bycatch, and the views of fishermen on the status of turtles (and marine mammals) and on existing regulations. This survey was repeated in 2012, in cooperation with research organizations for analysis, as part of research programs and / or ongoing on-board observer programs looking at bycatch and FADs - assessment not yet done.*

India

■ Chaudhari, S., K.V. Devi Prasad and K. Shanker. 2009. Impact of Casuarina Plantations on Olive Ridley Turtle Nesting along the Northern Tamil Nadu Coast, India. ATREE, Bangalore and MCBT, Mamallapuram, India. pp. 44. http://seaturtlesofindia.org/downloads/Casuarina_Report_2009.pdf. *This study examines the possible impacts of Casuarina equisetifolia plantations on olive ridley (Lepidochelys olivacea) turtle nesting beaches along the northern Tamil Nadu coast.*

■ Karnad, D., Isvaran, K., Kar, C. S., Shanker, K. 2009. Lighting the way: Towards reducing misorientation of olive ridley hatchlings due to artificial lighting at Rushikulya, India, Biological Conservation, Volume 142, Issue 10, October 2009, Pages 2083-2088, ISSN 0006-3207. http://www.sciencedirect.com/science/article/pii/S0006320709001748. *This study aimed to determine differential response of olive ridley hatchlings to distinct wavelengths and intensities of light, both in experimental and in-situ conditions.*

■ Mathew, S. 2004. Socio-economic aspects of management measures aimed at controlling sea turtle mortality: a case study of Orissa, India. Paper presented at the Expert Consultation on Interactions between sea turtles and fisheries within an ecosystem context. Rome, 9–12 March 2004. http://www.fao.org/docrep/007/y5750e/y5750e0d.htm. *Experiences made in implementing various management measures to reduce sea turtle mortality due to fishing along the coasts of the State of Orissa (India) are presented, with particular emphasis on the consequences that these have had on*

traditional fishing communities. Suggestions for possible socio-economic indicators to monitor the impact of these measures on fishing communities are also presented.

■ Pandav, B., Choudhury, B. C. 1999. An update on the mortality of the olive ridley sea turtles in Orissa, India. Marine Turtle Newsletter, 83, 10-12. http://www.seaturtle.org/mtn/archives/mtn83/mtn83p10.shtml. *Since November 1993, records of marine turtle strandings on the coast of Orissa have been kept as a part of the ongoing sea turtle research programme of the Wildlife Institute of India. The entire Orissa coast, stretching over 480 km has been divided into eight survey sectors (Pandav et al. 1994) and each of these sectors was walked once every two weeks during the breeding season (November-April). Dead turtles washed ashore were measured, sexed and marked with white paint on their carapace to avoid repeat counts during subsequent surveys.*

■ Pandav, B., Choudhury, B. C., Kar, C.S. 1997. Mortality of olive ridley sea turtle (Lepidochelys olivacea) due to incidental capture in fishing nets along Orissa coast, India. Oryx. 31(1): 32-36. *In the 1993/94 season, 5,282 dead olive ridley turtles were recorded. Near shore mechanised fishing, specifically shrimp trawling, is thought to be the major cause of this high mortality. Mortality due to such illegal trawling has been increasing each year and reached a record high of 13,575 ridleys in the 1997/1998 season.*

■ Rajagopalan R. 2009. Social Dimensions of Sea Turtle Protection in Orissa, India: A Case Study of the Gahirmatha (Marine) Wildlife Sanctuary and the Nesting Beaches of Rushikulya and Debi. http://aquaticcommons.org/2076/1/Sea_turtle.pdf. *This study focuses on the legal framework for sea turtle protection in the Indian State of Orissa. It documents the social consequences of turtle protection measures on fishing communities, and analyzes their experiences with various aspects of sea turtle protection. Its specific site focus is the Gahirmatha (Marine) Wildlife Sanctuary, and the Rushikulya river mouth and the Devi river mouth area.*

■ Rajagopalan, M., E. Vivekanandan, K. Balan & K. Narayana Kurup. 2001. Threats to sea turtles in India through incidental catch. In: Proceedings of the Workshop for the Development of a National Sea Turtle Conservation Action Plan, Bhubaneswar, Orissa (eds. K. Shanker & B.C. Choudhury), pp. 12-14. Wildlife Institute of India, Dehradun. *Unavailable.*

■ Rajagopalan, M., E. Vivekanandan, S. Krishna Pillai, M. Srinath & A.B. Fernando. 1996. Incidental catches of sea turtles in India. Marine Fisheries Information Service Technical & Extension Service 143: 8-16. *Unavailable.*

■ Varghese, S. P., S. Varghese and V. S. Somvanshi. 2010. Impact of tuna longline fishery on the sea turtles of Indian seas. Current Science 98 (10): 1378-1384. http://www.environmentportal.in/files/Impact%20of%20tuna%20longline%20fishery%20on%20the%20sea%20turtles%20of%20Indian%20seas.pdf. *This study provides quantitative data on the magnitude of sea turtle incidental catch of the tuna longline fishery in the Indian EEZ.*

■ VSPCA (Visakha Society for the Protection and Care of Animals). 2013. Report on the Olive Ridley sea turtle protection programme 2012-2013. http://www.vspca.org/pdf/VSPCA_Sea_Turtle_Report_2013.pdf

■ Wright, B. & B. Mohanty. 2002. Olive ridley mortality in gill nets in Orissa. Kachhapa 6:18. *Unavailable.*

Indonesia

■ Adnyana IBW & Frazier J. 2003. Trade of marine turtle in Bali. Internal report of WWF Indonesia. *Not found on the Web. (Source: IOSEA NR).*

■ Gjertsen, H. Hitipeuw, C. 2006. Using Socioeconomic Surveys to Design Community Incentives for Conservation. In Book of Abstracts from 26th Annual Symposium on Sea Turtle Biology and Conservation. Frick, M., A. Panagopoulou, A. F. Rees, and K. Williams (Eds.) International Sea Turtle Society, Athens, Greece, p. 346. *Unavailable.*

■ Hilterman, M. & Goverse, E. 2005. A note on the illegal trade in stuffed turtles in South Java Indonesia. Marine Newsletter 109:9. http://www.seaturtle.org/mtn/archives/mtn109/mtn109p9.shtml. *In August 2004, the authors visited two popular (domestic) tourist destinations on the south coast of central-west Java: Cilacap, a small town adjacent to and the jumping-off point for Nusa Kambangan ('Kambangan Island'), and the fishing village of Pangandaran, a small, partly forested peninsula that has been designated as a National Park. They were surprised by the large number of stuffed sea turtles of four species (olive ridley, green, hawksbill and loggerhead), in the hundreds at the very least, of various size classes openly for sale in souvenir shops at both locations, where they were also said to have been caught.*

■ ProFauna Indonesia. 2008. Sea Turtle Exploitation in the Name of Conservation in Bali. http://www.profauna.org/download/publication/turtle-exploitation-in-bali-%282008%29.pdf. *In July 2008, ProFauna visited the locations that kept sea turtles and found out that there were 5 places allegedly illegal.*

■ ProFauna Indonesia. 2005. Sea Turtle Trade on the South Coast of Java. http://www.profauna.org/download/publication/sea-turtle-trade-in-java-%282005%29.pdf. *ProFauna conducted an investigation on the sea turtle trade on the south coast of Java from January until April 2005. The initial funding from Royal Society for the Protection of Animals (RSPCA) only covered the investigation in the area of Teluk Penyu (Turtle Beach Bay), in Cilacap, Central Java. However, this has been stretched to cover investigations of other coastal areas in the south of Java.*

■ Roe, J. H., Morreale, S. J., Paladino, F. V., Shillinger, G. L., Benson, S. R., Eckert, S. A., Bailey, H., Tomillo, P. S., Bograd, S. J., Eguchi, T., Dutton, P. H., Seminoff, J. A., Block, B. A., Spotila, J. R. 2014. Predicting bycatch hotspots for endangered leatherback turtles on longlines in the Pacific Ocean. Proc. R. Soc. B February 22, 2014 281 1777 20132559. doi:10.1098/rspb.2013.2559 1471-2954. http://rspb.royalsocietypublishing.org/content/281/1777/20132559.full *This study integrated use-intensity distributions for 135 satellite-tracked adult turtles with longline fishing effort to estimate predicted bycatch risk over space and time in the Pacific Ocean. Areas of predicted bycatch risk did not overlap for eastern and western Pacific nesting populations, warranting their consideration as distinct management units with respect to fisheries bycatch. For western Pacific nesting populations, several areas of high risk in the north and central Pacific identified, but greatest risk was adjacent to primary nesting beaches in tropical seas of Indo-Pacific islands, largely confined to several exclusive economic zones under the jurisdiction of national authorities. For eastern Pacific nesting populations, moderate risk associated with migrations to nesting beaches were identified, but the greatest risk was in the South Pacific Gyre, a broad pelagic zone outside national waters where management is currently lacking and may prove difficult to implement. Efforts should focus on these predicted hotspots to develop more targeted management approaches to alleviate leatherback bycatch. In the WP, turtles were tracked from foraging waters off the coast of California, USA, and from nesting beaches at Jamursba-Medi and Wermon on the Bird's Head peninsula in Papua Barat, Indonesia, a location that contains 75% of all WP nesting activity*

■ Van Dijk, P.P. and Shepherd, C.R. 2004. Shelled out? A Snapshot of Bekko Trade in Selected Locations in South-east Asia. TRAFFIC Southeast Asia. http://www.traffic.org/species-reports/traffic_species_reptiles6.pdf. *TRAFFIC Southeast Asia carried out surveys in two traditionally key countries involved in the shell products, or bekko, trade, Indonesia and Vietnam, in Sept/Oct 2001 and Feb 2002 to establish the status of trade and stockpiles of bekko in selected locations.*

■ Waayers, D. 2006. Potential for developing marine turtle tourism as an alternative to hunting in Bali and Indonesia. Indian Ocean Turtle Newsletter 4. http://www.iotn.org/iotn-4-3.php. *The growth of the tourism industry in Bali has been expeditious, and has increased from 30,000 visitors in 1969 to more than half a million in 1990 (McCarthy, 2001). In Bali, the infrastructure for expanding the scope of ecotourism already exists, however the potential for developing turtle-based ecotourism for the purpose of substituting the turtle harvesting industry has not yet been recognised. This makes Bali an ideal candidate for investigating the use of tourism as an alternative to turtle hunting, and could be used as a benchmark for other developing countries facing similar issues.*

■ WWF Indonesia /Species Program. 2005. Relationships of marine turtle with Balinese religion, rites and culture: Anthropological review. Fakultas Sastra Universitas Udayana Bali, 81 pp. *Not found on the Web.*

■ Zainudin, I. M., Pet-Soede, L., Hitipeuw, C., and Adnyana, W. 2007. Interaction of Sea Turtles with Indonesian Fisheries – Preliminary Findings. Indian Ocean Turtle Newsletter 6. http://www.iotn.org/iotn-6-1.php. *Interviews with fishermen on tuna longliners and shrimp trawls. Findings: The Indonesian long-liners try to minimise interaction with turtles as they believe that sea turtles on-board will reduce their catch. Also, if the vessel's captain is Chinese or Taiwanese, they always release the turtles as they believe that sea turtles are divine creatures and must be respected. Our observers have an important role to play here to ensure that turtles are released properly. With their guidance and proper use of de-hookers, observers can increase the survival of turtles significantly. Also, the observers are the best individuals to conduct general awareness and training activities as they spent several months together on-board. Observers can utilise the crew's natural curiosity to talk about nature and best practices. Training and outreach onshore is difficult as most crews are away for long periods of time and want to spend time with their families. Tackling the issue of low compliance with installing TEDs on shrimp trawl vessels requires a different approach. The financial incentive is too high to leave the TEDs unused as the fixed salaries are very low.*

Iran (Islamic Republic of)

■ Mobaraki. A. 2010. Results of Sea turtle Study in Iran and The Conservation Needs. Second Marine Conservation Forum, Abu Dhabi, UAE, 2010. http://assets.panda.org/downloads/mcf2010_proceedings.pdf. *This report identifies threats to marine turtles, such as poaching and egg collection.*

Jordan

N. A.

Kenya

■ Baobab Trust. 2010. Sea Turtle Annual Report: Baobab Trust's sea turtle conservation project since 1989. http://www.thebaobabtrust.com/Turtle_Annual%20Report%202010x.pdf

■ Church, J.E., Palin, O. 2003. The sea turtle conservation initiative in the Kiunga Marine National Reserve, Lamu, Kenya from February 1997 to June 2003. Report for WWF East Africa Regional Programme Office. 1-107 p. http://www.ioseaturtles.org/bibliography_search_detail.php?id=305. *Unavailable. This report aims to analyse all the research and monitoring information gathered since 1997, and to provide recommendations for successful conservation and management measures for the sea turtle populations in the KMNR, within the broader Kenyan and Eastern African context.*

■ Lamcot. 2010. Annual Report 2009-2010. http://www.lamcot.org/quarterly-newsletters/2010/01/07/lamcot-annual-report-2009-2010

■ Mwakha, V. 2011. Estimating the value of Goods and Services in a Marine Protected Area: The Case of Watamu Marine National Park and Reserve, Kenya. ECOMAMA Program, Vrije Universiteit Brussel. PhD thesis: http://41.215.122.106/dspace/handle/0/435. *This study determined the monetary value of goods and services within the Watamu Marine National Park and Reserve, the distribution of conservation benefits and costs amongst stakeholders and the costs of biodiversity conservation.*

■ Nzuki, S. 2005. KESCOM study exposes rampant turtle trade. 7-9 p. In: Humphrey,S.L., Wilson, A. (Eds.), Marine turtle update: Recent news from the WWF Africa and Madagascar marine turtle programme. http://awsassets.panda.org/downloads/marineturtleupdate_nov05.pdf. *More than 600*

records of illegal trade and consumption patterns were reported during the survey between January and July 2005.

■ Nzuki, S. 2004. KESCOM surveying trade in turtle product. 15-16 p. In: Wilson, A., Humphrey, S.L. (Eds.), Marine turtle update: Recent news from the WWF Africa and Madagascar. http://assets.panda.org/downloads/africanmarineturtleupdate1.pdf. *With little opportunity for alternative livelihoods, fishers see no value in conserving turtles and those caught in nets become 'part of the catch'.*

■ Oman, R. 2013. The local ocean trust: Watamu turtle watch by-catch net release programme. Indian Ocean Turtle Newsletter No. 17. JANUARY 2013. http://www.iotn.org/pdf/iotn17_8.pdf. *A description of the project:* Turtle Nest Monitoring and Protection Programme, By-catch Net Release Programme, Rehabilitation Centre, Data Collection and Research, Community Outreach and Awareness Programme, Education Programme,

■ Wamukota, A., Okemwa, G.M. 2008. Perceptions about trends and threats to sea turtles in Kenya. 1-18 p. http://www.ioseaturtles.org/bibliography_search_detail.php?id=330. *Information on perception, trends, status and major conservation issues relating to sea turtles in Kenya was collected between November 2003 and December 2004 among 23 communities along the 600 km long Kenyan coast. The objective was to determine major conservation issues and identify solutions. The survey employed participatory rural appraisal (PRA) methodologies including transect walks, observation, resource mapping, problem visualizations, seasonal calendars, time lines, resource prevalence trend lines and structured interviews. Data was analysed through ranking and scoring. PRA results indicated a steady decline of sea turtle populations in six sites by between 25 - 75% from the early 80's. Overall, marine fisheries were identified as the basis of livelihood and a leading cause of marine turtle strandings on Kenyan beaches accounting for over 50% of reported cases. Over 90% of the participants indicated willingness to conserve sea turtles by using appropriate fishing gear but cited lack of initial capital outlay to purchase the recommended gear.*

Madagascar

■ Cinner, J., Fuentes, M. M. P. B., Randriamahazo, H. 2009. Exploring social resilience in Madagascar's marine protected areas. Ecology and Society 14(1): 41. http://www.ecologyandsociety.org/vol14/iss1/art41/ *Researchers examined and compared aspects of local-level resilience in 13 coastal communities within and adjacent to all Madagascar's national marine protected areas. This study included marine turtles in its scope but did not focus on them.*

■ Davies, T.E., Beanjara, N. & Tregenza, T. 2009. A socioeconomic perspective of gear based management of an artisanal fishery, SW Madagascar. Presented at the 6th WIOMSA Scientific Symposium, St. Denis, Réunion Island. 24-29 August 2009. Fisheries Management and Ecology, 2009. http://www.reefdoctor.org/wp-content/uploads/Davies-et-al.-2009.pdf. *A paper by ex- science and socio-economic ReefDoctor staff on the socio-economic perspectives on gear-based management in the Bay of Ranobe.*

■ Gibbons, E., Remaneva, L. 2011. Curio Trade: Southwest Madagascar. ReefDoctors report. http://www.reefdoctor.org/wp-content/uploads/Curio-Trade-Assessment.pdf. *Evaluation of the curio trade in Toliara, Ifaty and Mangily has highlighted the large demand for curio products by tourists visiting Madagascar. This trade has even extended to include endangered and vulnerable species protected under national and international law. It is therefore paramount, that steps are taken to improve awareness and outreach programs so vendors and clients can make informed decisions about the purchase of curio products.*

■ Jones, K. N. 2012. Examining trends in taste preference, market demand, and annual catch in an indigenous marine turtle fishery in southwest Madagascar. Research Thesis. http://www.reefdoctor.org/wp-content/uploads/SIT-Turtle-Fishery-Research-Thesis.pdf. *A 2012 thesis submitted to Washington State University by Kristin Jones, a SIT student (The School for International Training Study Abroad) on taste preferences, market demand and annual catch of the turtle fishery in the Bay of Ranobe.*

■ Langley J. 2006. Vezo knowledge: Traditional ecological knowledge in Andavadoaka, Southwest Madagascar. http://www.travelroots.com/downloads/bv-research-report-2006-langley-tek.pdf. *Takasy (ranja) is a request to the ancestors for continued success in obtaining something. For example, a Takasy Fano (for turtles) involves giving thanks for a recently caught turtle and requesting that the ancestors allow more to be caught in the future. The Vezo build a shrine on a site that is considered favourable. The turtle Fomba is where all turtles are killed. Nosy Hao has two turtle Fomba. The carapaces are used to cook the turtle meat and retain the blood, as it is strictly taboo to spill the turtle's blood on the sand. The carapaces are kept at the shrine and the spears used to catch the turtles are also kept, with the head of the turtle speared through the mouth. The heads are raised on spears surrounding the Fomba amid the carapaces of former kills kept in the centre of the shrine.*

■ Muttenzer F. 2007. 'Different kinds of people of the sea': écologie, mobilité et ethnicité chez les Vezo de Madagascar. Etude de gouvernance locale des tortues marines aux îles Barren, Maintirano. http://www.ruiggian.org/ressources/DESAT_social_intermed_RUIG%20nvelle%20version%20070626.pdf. *In Vezo traditional conception, turtles symbolize the relationship that men have with a distinct ecological environment from those which provide sustenance to other Malagasy. Turtles are a sign of wealth of the sea that the creator donated human, and Vezos identify turtles as a collective.*

■ Poonian, C., Whitty, T. Unpublished. Socioeconomic Drivers of Sea Turtle Interactions with Artisanal Fisheries in the Western Indian Ocean Islands. C3. Unpublished. http://c-3.org.uk/fisheries-bycatch-a-major-threat-to-sea-turtles/ *Unpublished report. Bycatch in small scale fisheries is a significant threat to sea turtles in the Indian Ocean. Authors amassed a significant body of work on relevant ecological and socioeconomic issues in fishing communities in the Comoros, Mauritius and Madagascar. Collaborators included Duke University and Scripps Institute of Oceanography in the USA along with numerous local partners. This work has been presented at regional and international symposia and we expect to publish a major paper from this work in late 2013.*

■ Rakotonirina, B.P., Razafinjara, A.L. and S.P.Harding. 2004. Madagascar Status Report. Western Indian Ocean (WIO) Region. Marine Turtle Workshop. *Unavailable.*

■ Ramamonjisoa, V.C. 1997. Etude de l'exploitation des tortues marines dans le Nord de Tolagnaro en vue de leur conservation. Memoire de Certificat d'Aptitude Pedagogique de l'Ecole Normale, Antananarivo. *Unavailable.*

■ Walker, R.C.J., Roberts, E. 2005. Notes on the Status and Incidental Capture of Marine Turtles by the Subsistence Fishing Communities of South West Madagascar. Western Indian Ocean J. Mar. Science 4 (2). http://www.ajol.info/index.php/wiojms/article/view/28491. *Study on the economic and cultural importance of sea turtles to coastal communities in south-west Madagascar; need to develop alternative livelihoods for impoverished coastal communities. This paper investigates incidental capture and the egg harvesting of five species of turtle by eight subsistence fishing communities in south west Madagascar. Data were collected through semi-structured interviews with fishers from each community over a period of three weeks during March 2002. Turtles were captured as part of a seasonal, multi-species fishery using spear guns and shark gill nets. Capture rates varied widely during the peak fishing season of October to March with respondents from the village of Maromena reporting monthly anecdotal capture rates of approximately 300 individuals.*

■ Walker, R.C.J., Roberts, E., Fanning, E. 2004. The trade of marine turtles in the Toliara region, South West Madagascar. Marine Turtle Newsletter 106: 7-10. http://www.seaturtle.org/mtn/archives/mtn106/mtn106p7.shtml. *As marine turtles have become an increasingly scarce resource, commanding higher prices, entrepreneurial individuals have started buying marine turtles from fishermen, with the intention of selling them at a profit. The shift from occupational hunting to incidental or occasional hunting means less importance has been placed on marine turtles by the fishermen who now target multiple marine species, and are unable to generate high enough turtle catches to sustain a consistent supply to traders. This position in the local economy has been taken over by the dealers who tend to deal with the catch from multiple sources (fishermen) thus being able to maintain a relatively consistent supply of marine turtle products, if favourable weather conditions allow for fishing to take place.*

■ Walker RCJ, Fanning E. 2003. Artisanal and traditional turtle resource utilisation in South West Madagascar. Frontier Madagascar Environmental Research Report 2. http://www.ioseaturtles.org/bibliography_search_detail.php?id=89. *Data on annual catch levels and resource utilisation of the five species of turtle was collected through logbooks and interviews with those involved in the local trade.*

■ Whitty, T. S. 2010. Rapid assessment of marine megafauna capture, fishing effort and socio-economic and cultural drivers of artisanal fisheries in Northern Madagascar. http://c-3.org.uk/wordpress/wp-content/uploads/pdf/peer_reviewed_papers/paper1/Tara_Whitty_CZAP-WSFC2010.pdf. *573 interviews were conducted in 13 sites in artisanal fishing villages in northern Madagascar (encompassing a total of 35 landing sites), from July 2009 through June 2010. Sea turtle bycatch was frequent, with 133 respondents reporting accidental capture (and 18 reporting targeted capture). Most capture occurred in nets, including jarifa, and longlines, though some fishers reported catching them by hand while they were nesting. Most fishers would release accidentally caught sea turtles.*

Malaysia

■ Bin Wagiman, S., Sharma, D.S.K., Chark, L. 2006. Socioeconomic Linkages and Impacts of Fisheries on Sea Turtle Population. In M. Ahmed, S. Wagiman, K. Ibrahim, S.C. Ho, H.C. Liew, B.H. Yeo, M.M. Lau, M.N. Basiron and D.S.K. Sharma (eds). 2006. Charting Multidisciplinary Research and Action Priorities towards the Conservation and Sustainable Management of Sea Turtles in the Pacific Ocean: A Focus on Malaysia, 16-17 August 2004, Terengganu, Malaysia. The WorldFish Center Workshop Proceedings 74, 106 p.. *This review reports the impacts of Incidental Capture and Mortalities, Illegal Fishing in Marine Protected Areas, Illegal Fishing by Foreign Fishers, Illumination of Fishing Vessels, Illegal and Unlicensed Harvest of Eggs, Land-based Pollution, Coastal Armoring, Reclamation of Land and Sea and Coastal Tourism on marine turtles in Malaysia.*

■ Chan, E.H., N. Pilcher and K. Hiew. 2009. Report of the Workshop on Regional Cooperation to Address Direct Capture of Sea Turtles 1-3 June 2009, Kuala Terengganu. Penerbit UMT, Universiti Malaysia Terengganu. http://bookstore.umt.edu.my/index.php?route=product/product&product_id=103. *Book not freely available on the Web and studies of relevance could not be identified. The workshop focused on the illegal capture of hawksbill and green turtles in the waters of Indonesia, Malaysia and Philippines – mainly by vessels operating out of China's Hainan province. Some estimates suggest that about two-thirds of the individuals involved in this illegal fishing are Chinese nationals.*

■ Chan, E. H. 2006. "Marine turtles in Malaysia: On the verge of extinction?" Aquatic Ecosystem Health and Management 9: 175-184. http://www.ioseaturtles.org/bibliography_search.php?file=Ref_ID_1664_908FB3E0d01.pdf&items_id=1664. An assessment of the status of four species of marine turtles (leatherback, green turtle, hawksbill and olive ridley) found in Malaysia, looking at consumptive utilization in the form of egg exploitation, turtle use for tourism in Terengganu and Sabah, commercial hunting and harvesting of marine turtles in neighbouring countries, fishing mortality, loss of nesting habitats, marine pollution, negative impacts of tourism and the lack of a national strategy on marine turtle conservation.

■ Chan, E . H., Shepherd, C. R. 2002. Marine Turtles: The Scenario in Southeast Asia. Tropical Coasts. 9 (2), 38 -43. http://www.reefbase.org/resource_center/publication/pub_20860.aspx. *Not freely available on the Web. This paper reports how marine turtles are utilized by people in Southeast Asia in different ways, including commercial egg harvesting and animal hunting. Egg collection for consumption is one of the major forms of exploitation of marine turtles in the Southeast Asian region, with the Philippines, Indonesia and Malaysia known to be source and consumer countries. In the Philippines, although national laws now prohibit turtle egg collection, it is common knowledge that at the local level in the Tawi-Tawi Islands, up to 70 percent of the eggs are harvested and smuggled through an effective network which supplies neighboring countries. The turtle egg industry of the Berau District of East Kalimantan, Indonesia, which supports the largest aggregations of green turtles in the country has been estimated to generate an income of over US$200,000 a year. In*

Malaysia, commercial egg collection takes place only in Terengganu where the local government issues licenses to the local villagers by tender. The value of this activity is estimated at no more than US$50,000 per year.

■ Ibrahim K, Van de Merwe J, Whittier J. 2002. Full or split clutches - which strategy should be adopted in managing marine turtle hatchling production? Proceedings of the 3rd Workshop on SEASTAR2000 (2002) 111-114. http://www.ioseaturtles.org/bibliography_search.php?file=Ref_ID_1734_EBD8ACF6d01.pdf&items_id=1734. *A statistical analysis on Chelonia mydas incubation data for a turtle nesting beach (Mak Kepit, Terengganu) and a hatchery (Chendor, Pahang) in Peninsular Malaysia. From this finding and cost of hatchery operations, it is recommended that hatchery should incubate full clutch eggs.*

■ Moore, J. E., Cox, T. M., Lewison, R. L., Read, A. J., Bjorkland, R., McDonald, S. L., Crowder, L. B., Aruna, E., Ayissi, I., Espeut, P., Joynson-Hicks, C., Pilcher, N., Poonian, C.N.S., Solarin, B. Kiszka, J. 2010. An interview-based approach to assess marine mammal and sea turtle captures in artisanal fisheries. Biological Conservation, 143(3), 795-805. http://www.sciencedirect.com/science/article/pii/S000632070900531X. *An intensive pilot study to evaluate whether interview surveys can be effective in assessing fishing effort and threatened species bycatch. In-person surveys were conducted during 2007 and 2008 in fishing communities from seven countries: Sierra Leone, Cameroon, Nigeria, Tanzania, Comoros, Malaysia, and Jamaica.*

Pilcher, N. J., Ramachandran, T., Dah, T. C., Ee, L. S., Beliku, L., Palaniveloo, K., Hin, L. K., Ling, L. S., Hui, L. C., Lewison, R., Moore, J. 2007. Rapid gillnet bycatch assessment: Sabah, Malaysia. *In* Tacking Fisheries Byatch: Managing and reducing sea turtle bycatch in gillnets. 28th International Sea Turtle Symposium Workshop proceedings, 25 January 2008. Loreto, Baja California Sur, Mexico. http://bycatch.nicholas.duke.edu/publicationsandreports/GloBAL%20ISTS%20Proceedings%202008.pdf. *From April to August 2007 the Marine Research Foundation partnered with interns from Universiti Malaysia Sabah to conduct studies throughout Sabah, Malaysia, to investigate bycatch of key marine taxa in major fisheries and to field trial a Rapid Assessment Survey designed by experts at San Diego State University and Duke University in the USA.*

■ Sharma, D.S.K., I.N. Louis and Mohd. Nasir, A.S. 1996. A review of the impacts of coastal, offshore and riverine development on marine turtles and terrapins. Paper presented at the National Seminar/Workshop on Marine Turtle and Terrapin Management, 22-23 October 1996, Club Med, Malaysia. *Not found on the Web. A comprehensive review of the impacts of coastal, offshore and riverine development on marine turtles and terrapins in Malaysia that revealed that numerous anthropogenic activities encroach and impact turtles and their habitats.*

■ Teh, L. C., Teh, L. S., & Chung, F. C. 2008. A private management approach to coral reef conservation in Sabah, Malaysia. *Biodiversity and conservation*, *17*(13), 3061-3077. http://www.reef-guardian.org/files/SIMCA_BioCons_publication.pdf. *This study assesses the private investment and management of the the Sugud Islands Marine Conservation Area (SIMCA) in Sabah, Malaysia.*

■ Van de Merwe, J., Ibrahim, K., Irvebrant, M., Whittier, J. 2002. Effects of hatchery nest density on the emergence success and quality of Chelonia mydas hatchling. Proceedings of the 3rd Workshop on SEASTAR2000 (2002) 115-119. http://www.ioseaturtles.org/bibliography_search.php?file=Ref_ID_1910_8612858Cd01.pdf&items_id=1910. *The aim of this experiment was to determine the effects of increasing the nest density on emergence success and quality of emerging hatchlings. In June 2002, twenty-nine nests were placed in normal density and ten nests were placed in high density in the Ma'Daerah hatchery, Terengganu, Malaysia. A sample of at least 10 hatchlings emerging from these nests were subjected to a running trial over 1.6 m and were weighed, measured and scale counted.*

■ Wahab, T., Naning, S. N., Husin, M. A., Arshaad, W. A. 2013. Interaction Between Sea Turtle and Human Activities: A Survey on Local Communities' at Kuala Lawas off Brunei Bay. Regional Meeting on Conservation and Management of Sea Turtle Foraging Habitats in Southeast Asian Water. 22-24 October 2013, Kuala Lumpur. http://www.ioseaturtles.org/UserFiles/File/elec_lib/Presentation%20seafdec%202013%20kuala%20lumpur-TAHA%20WAHAB.pdf. *This study collected basic socioeconomic profiles on communities*

along Kuala Lawas off Brunei Bay and identified their interests in protecting and conservation of marine turtle and the number and species of turtle that are frequently caught by fishing activities at Kuala Lawas off Brunei Bay.

■ WWF. 2009. Survey of Marine Turtle Egg Consumption and Trade in Malaysia. Report prepared by TRAFFIC Southeast Asia for WWF-Malaysia March 2009 WWF – World Wide Fund for Nature (formerly World Wildlife Fund), Petaling Jaya, Malaysia. http://awsassets.wwf.org.my/downloads/survey_of_marine_turtle_egg_consumption_and_trade_in_malays.pdf. *This study assesses the extent of marine turtle egg consumption and trade in Malaysia. A socioeconomic survey to understand their profile and perception was conducted via interviews with turtle egg consumers. The survey on source and trade routes was conducted via interviews with egg collectors, sellers, key informants and government agencies and through literature review.*

Maldives

■ Anderson, R. C., Zahir, H., Jauharee, R., Sakamoto, T., Sakamoto, I., and Johnson, G. 2009. Entanglement of Olive Ridley Turtles Lepidochelys olivacea in ghost nets in the equatorial Indian Ocean. IOTC-2009-WPEB-07. http://www.iotc.org/files/proceedings/2009/wpeb/IOTC-2009-WPEB-07.pdf. *Records of olive ridley turtles, Lepidochelys olivacea, in the Maldives (n = 45) were compiled. 71% of recent records (n= 34) were of olive ridley turtles entangled in pieces of fishing net (ghost nets), suggesting that this is an important cause of juvenile mortality.*

■ Currey, D., Matthew, E. 1996. Report on an Investigation into Threats to Marine Turtles in Sri Lanka and the Maldives, Environmental Investigation Agency, London. 28 pp. *Unavailable. The Environment Investigation Agency (EIA) found tortoiseshell products were openly available in shops in Colombo in March 1995 despite a complete ban on its sale in Sri Lanka. The EIA infiltrated the trade and their investigation revealed that four main dealers were exporting tortoiseshell to Sri Lanka from Maldives, often smuggled in consignments of dried fish, and tracked down the biggest supplier in the Maldives. The entire EIA investigation was filed with hidden camera. On 30 March 1995 as part of the "Animal Detectives" series British national television broadcasted the entire investigation.*

Mauritius

■ Griffiths, O. and Tatayah, V. 2007. Rapid survey of marine turtles in Agalega, Western Indian Ocean. Marine Turtle Newsletter 115: 14 - 16. http://www.ioseaturtles.org/bibliography_print.php?id=336. *Interview with residents of the Agalega Islands revealed that turtles were being slaughtered, although the public is aware of the legislation prohibiting this.*

■ Poonian, C., Whitty, T. Unpublished. Socioeconomic Drivers of SeaTurtle Interactions with Artisanal Fisheries in the Western Indian Ocean Islands. C3. http://c-3.org.uk/fisheries-bycatch-a-major-threat-to-sea-turtles/ *Unpublished report. Bycatch in small scale fisheries is a significant threat to sea turtles in the Indian Ocean. This report addresses ecological and socioeconomic issues in fishing communities in the Comoros, Mauritius and Madagascar. This work has been presented at regional and international symposia and it was expected to lead to the publication of a major paper from this work in late 2013.*

Mozambique

■ Gaspar, A. C. 2010. Local people's perceptions of marine protected areas: a case study of Ponta do Ouro, Mozambique. PhD diss., 2010. http://researchspace.ukzn.ac.za/jspui/bitstream/10413/338/1/AnselmoThesisFinal.pdf. *This study investigated respondents' perceptions of the Ponta do Ouro – Kosi Bay MPA. An interviewer - administered questionnaire was used to obtain primary data from 35 respondents, all resident in the study area and who are involved in various activities based on the coastal area and its marine*

resources. The focus of the study was on awareness regarding the establishment, impacts of the MPA, the setting of priorities for the MPA and lastly, respondents' roles and responsibilities. This study included marine turtles in its scope but did not focus on them.

■ 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 TED (Turtle Excluder Device) on shrimp fishery. 23 pp. Maputo, Report to the Eastern Africa Marine Eco-Region of WWF. http://bcnet.org/expeditions/mozambique/pdfs/tedfinal.pdf. *The study was carried out in August and November 2001 in the southern part of Sofala Bank (Central Mozambique), the main shallow water shrimp fishing area of Mozambique. Inquiries were carried out in Maputo, Beira and Chiloane, while two shrimp trawlers belonging to a private fishing company did trawling. The study quantified the impact of prawn trawling on marine turtles on the Sofala Bank and the effect of TEDs on this fishery.*

■ Guissamulo, A. T., Tivane, I. P., Chacate, O. E., Chauque, A. M. 2009. Beach seine fishery at Inhassoro coast, Southern Mozambique: spatial distribution, incidental catches of sea turtles and removal of seagrasses. Sixth WIOMSA Scientific Symposium, St. Denis, La Réunion, 24-29 August 2009. http://www.wiomsa.org/index.php?option=com_jdownloads&task=view.download&cid=682&Itemid=53. *This proceeding reports estimates of quantified incidental turtle captures by beach seining at Inhassoro and Vilanculos. It arises from a study made in 2005, but that could not be found on the Web.*

■ Guissamulo, A., Balidy, H. and Hill, N. 2003. Socio-economic survey of communities and survey of fisheries. In Report for the Marine Programme, November 2003. ZSL/ Cabo Delgado Biodiversity and Tourism Project, Pemba, Mozambique. *Not found on the Web. A preliminary study to the ZSL/ Cabo Delgado Biodiversity and Tourism Project, to assess the perception of resource users on Vamizi of the threats to ecosystem productivity*.

■ Louro, C. M. M., M. Pereira & A. Costa 2006. Report on the Conservation Status of Marine Turtles in Mozambique. January 2006. Centro de Desenvolvimento Sustentavel para as Zonas Costeiras. http://www.zonascosteiras.gov.mz/IMG/pdf/Turtle_report_final_EN_1__1_.pdf. *This report presents published information as well as data regarding occurrence and threats to marine turtles provided by several individuals consulted, especially tourism operators from remote locations in the coast. The study reports some turtle watching activities (ecotourism) that have been incorporated with the monitoring programme along the Matutuine coast; illegal longline fishing responsible for the killing of marine turtles; mortality due to subsistence use.*

Myanmar

N.A

Oman

■ ESO. 2009. Report on the impacts of light pollution. ESO collaborated with Five Oceans (Environmental Services) LLC to conduct light pollution surveys throughout the Turtle Reserve between November 2008 and February 2009. *Unpublished. Description available at http://www.ioseaturtles.org/feature_detail.php?id=305*.

Pakistan

■ Hasan S.A. 2011 Socio-Economic Baseline Report, Astola Island. *Unpublished report. Socio-economic study conducted on Astola Island during January 2011 to determine the dependence of various communities on the Island.*

Papua New Guinea

■ Kinch, J. 2006. A Socio-economic assessment of the Huon Coast Leatherback Turtle Nesting Beach Project. Final report prepared for the Western Pacific Regional Fisheries Management Council, Honolulu, Hawaii, USA. http://www.ioseaturtles.org/UserFiles/Image/Kinch_report_final.pdf. *Recognizing that sea turtle conservation involves the management of human induced threats and anthropogenic impacts, the Western Pacific Regional Fisheries Management Council (WPRFMC) contracted an anthropologist to assist in understanding the social and economic impacts within the participating communities.*

■ TRAFFIC. 2009. An Assessment of the Trade in Hawksbill Turtles in Papua New Guinea. TRAFFIC Bulletin Vol. 22 No. 2. http://www.environmentportal.in/files/Hawksbill.pdf. *Between May and August 2007, the lead author conducted surveys of retail outlets in nine regional centres across eight provinces in Papua New Guinea. Information such as volumes of trade, number of traders, trade dynamics, possible sources of marine turtles, species involved in the trade, trade routes, and end destinations was gathered through informal and semi-structured interviews with market sellers, artefact retailers, hotel staff and discussions with members of the public. Various government agencies, conservation non-governmental organizations and local universities were also consulted. Data from the UNEP-WCMC CITES trade database on Hawksbill Turtle trade from 1950 to 2006 were analysed and compared across the Oceania region.*

Philippines

■ Cola, R. 2003. Post-term Social Impact Analysis for Turtle Islands Integrated Conservation and Development Project. WWF-Philippines Research Paper. *Unavailable. Findings*: *Percentage of Income form Turtle Egg Collection to Total Income is only 23% and the Number of Households affected in a year is only 11%. This proves that turtle egg collection is not an important factor in income of the community, although fishery resources represents 63%.*

■ Cola, R. 1998. Social and Institutional Assessment for Turtle Islands Integrated Conservation and Development Project. WWF-Philippines Research Paper. *Unpublished report.*

■ EPAFI. 2005. Zambales Turtle Conservation Program 2004-2005. http://environmentalprotectionofasia.com/ztcp/reports/2004_2005.htm

■ WWF. 2005a. Turtle Islands: resources and livelihoods under threat. A case Study on the Philippines. http://www.wwf.org.ph/downloads/TurtleIslands.pdf. *This case study analyses some of the key lessons learned during the implementation of the WWF-Philippines Integrated Conservation and Development Project (ICDP) in the Turtle Islands. Includes an evaluation of the social impacts of the conservation activities undertaken at the site.*

Saudi Arabia

N. A.

Seychelles

■ Domingue, G., Mortimer, J.A. 2001. The impact of commercial fisheries on turtles in Seychelles. 81 pp. In: Ciccione, S., Roos, D., Le Gall, J.-Y. (Eds.), Advance in Knowledge and Conservation of Sea Turtles in South-West Indian Ocean. 81 pp.81 pp. http://www.ioseaturtles.org/bibliography_print.php?id=371. *This study reports on purse seining being responsible for the incidental capture of large numbers of juvenile Hawksbills. Leatherbacks have been landed occasionally by tuna longliners, although most of these turtles were reportedly released alive. Dormant gillnets associated with artisanal fishing could be a significant fisheries-related threat to marine turtles in the Seychelles.*

■ Mortimer, J.A. 2004. Seychelles Marine Ecosystem Management Project (SEYMEMP) - Turtle component: Final report - Appendices 1 to 11. 1-159 p.

http://www.ioseaturtles.org/bibliography_search_detail.php?id=423. *Survey conducted during 2001-02 nesting season to evaluate public attitudes to turtles & turtle conservation among coastal residents of South Mahe (part of the GEF: Seychelles Marine Ecosystem Management Programme).*

■ Mortimer, J.A. 1999. Turtle shell stockpile burnt. Oryx 33: 98-107.

■ Mortimer, J. A. 1998. Turtle and Tortoise Conservation. Project J1: Environmental Management Plan of the Seychelles. Final report to Ministry of Environment Republic of Seychelles and Global Environment Facility (GEF). January 1998. Vol 1: 82 pp. Vol 2: Appendices 1–50. http://www.ioseaturtles.org/bibliography_search_detail.php?id=376. *Human Impacts Assessment. Data gathered during beach surveys, from autopsies on dead turtles reported by the public, from police records and reports, and also from other sources were used to assess levels of human induced turtle mortality and the market forces motivating it. Destruction of nesting habitat in the Granitic Islands, the impact of feral animals on nesting beaches throughout the country, and accidental mortality caused by fishing gear were also assessed. Efforts to promote turtle tourism were encouraged and assessed. (See pages 22-30.) The report includes an assessment of hawksbill and green turtle status and threats, as well as recommendations.*

South Africa

■ Petersen, SL, Honig MB, Ryan PG, Nel R, Underhill LG. 2009. Turtle bycatch in the pelagic longline fishery off southern Africa. African Journal of Marine Science 31:87-96. *Not found on the Web. Birdlife SA & WWF have (jointly) reviewed the impacts of longlining and trawling on vulnerable species. Capture by pelagic longline fisheries has been identified as a key threat to turtle populations. This study is the first assessment of turtle bycatch in the South African pelagic longline fishery for tunas Thunnus spp. and swordfish Xiphias gladius.*

■ Young N. 2001. An analysis of the trends in by-catch of turtle species, angelsharks and batoid species in the protective gillnets off KwaZulu-Natal, South Africa. MSc. Thesis, University of Reading. *Not found on the Web. 27km fixed nets / drum lines ~50 Caught per annum; 1/2 released alive.*

Sri Lanka

■ Clem, T., Wilson, C. 2003. Open-Cycle Hatcheries, Tourism and Conservation of Sea Turtles: Economic and ecological Analysis. Economics, Ecology and the Environment, The University Of Queensland. Working Paper 78. http://ageconsearch.umn.edu/bitstream/48959/2/WP78.pdf. *With a focus on Sri Lanka, this study considers the role that tourism-based sea turtle-hatcheries can play in conserving populations of sea turtles by combining economic analysis of markets with ecological parameters. Background is provided on the nature and development of such hatcheries in developing countries, giving particular attention to Sri Lanka. The modelling provided helps with the assessment of the impacts of turtle hatcheries on the conservation of sea turtles and enables ecological consequences of tourism, based on such hatcheries, to be better appreciated than in the absence of such modelling. The results demonstrate that sea turtle hatcheries that operate for tourist purposes can make a positive contribution to sea turtle conservation, but this depends on the manner in which they are conducted. Possible negative effects are also identified.*

■ Kapurusinghe, T., Saman, M. M. 2002. Marine turtle by-catch in Sri Lanka. A collection of TCP Research Papers Vol 1. L. Ekanayake, The Turtle conservation Project (TCP) Sri Lanka: 46-49. http://www.seaturtle.org/PDF/LalithEkanayakeEM_2002_TurtlepapersTCPSriLankaVollume1.pdf. *This by-catch survey was carried out between September 1999 and November 2000 in order to assess the extent and nature of incidental marine turtle by-catch at fish landing sites within programme boundaries by collecting data on marine turtle entanglements. Information derived from this survey was then used to formulate an action plan to minimise turtle by-catch in Sri Lanka. Sixteen major fish landing sites were selected for this survey. The programme included an introductory seminar programme for fishermen at each fish landing site and the collection of by-catch data from each site.*

Between November 1999 and November 2000 a total of 5241 turtle by-catch was reported, this figure included all five species of turtle which nest on the beaches of Sri Lanka. A total of13760 interviews with fishermen were carried out, which represented a sample of 39%'of the total fishermen operating from the landing sites selected.

■ Rajakaruna, R. S., Wijayatilaka, N., Ekanayake, E. L., & Ranawana, K. B. 2012. Tortoiseshell Trade in Sri Lanka: Is Centuries-old Trade Now History? Marine Turtle Newsletter, 134, 9-11. http://www.seaturtle.org/mtn/archives/mtn134/mtn134p9.shtml. *A presentation of findings based on the responses received during the interview from the retailers after explaining the objective of the study.*

■ Rajakaruna, R. S., Naveen, D.M., Dissanayake, J., Ekanayake, E.M. Lalith, Ranawana, K. B. 2009. Sea turtle conservation in Sri Lanka: assessment of knowledge, attitude and prevalence of consumptive use of turtle products among coastal communities. Indian Ocean Turtle Newsletter 10(1): 1-13. http://www.iotn.org/iotn-10-1.php. *This study was conducted to assess the knowledge of villagers about sea turtles, their attitude towards conservation of sea turtles and the prevalence of consumptive use among the villagers in six villages along the northwestern, western, southwestern and southern coast of Sri Lanka.*

■ Richardson, P. 2002. Tortoise shell industry in Sri Lanka: a survey report 1996. A collection of TCP Research Papers Vol 1. L. Ekanayake, The Turtle conservation Project (TCP) Sri Lanka: 1-15. http://www.seaturtle.org/PDF/LalithEkanayakeEM_2002_TurtlepapersTCPSriLankaVollume1.pdf. *The report shows that the actions of the government to stop the tortoiseshell trade were elective to a certain extent. Despite this the tortoiseshell trade continues to thrive in Sri Lanka. Therefore the report calls for more action to be taken and includes a list of recommended actions to be taken by the government, NGO's and the media in order to put and end to the sale of tortoiseshell in Sri Lanka.*

■ UNDP. 2007. Conservation of RUK Coastal Ecosystem: Conservation of Biodiversity through Integrated Collaborative Management in the Rekawa, Usangoda and Kalametiya Coastal Ecosystems, Sri Lanka. Final Report of the Terminal Evaluation Mission, March 2007. ATLAS ID GEF-00014812. http://erc.undp.org/evaluationadmin/downloaddocument.html?docid=1869

Thailand

■ Adulyanukosol, K., Ruangkaew, R. 2003. Sea turtle stranding records in the Andaman coast, Thailand. In: Proceedings of the 3rd Workshop on SEASTAR2000 (Editor: Arai, N.) pp. 105–109. http://www.ioseaturtles.org/bibliography_print.php?id=1604. *Study on the importance of sea turtle strandings with fishing nets.*

■ Okuyama, J.,Kanokwan, B., Panumard, B., Somachai, M., Mickmin, C., Nobuak, A. 2003. The regional management model for ecotourism planning in the Rayong coastal area, Thailand. http://www.pmbc.go.th/webpmbc/MarEndager/Download/Others/2003_Okuyama_et_Rayong_Ecotourism_Model.pdf. *The objective of this study was to construct a regional management model on the basis of resident's perception and awareness to assess some important ecological and economic interlinkages between tourism, coastal environment and local society in the Flayong coastal area, Thailand. In addition, authors suggested an ecotourism planning and regional management from the result of modeling. For modeling, available statistical data and materials on tourism, environment, fishery, and local community were gathered. Furthermore, a questionnaire survey for 188 groups of tourists visiting to the Rayong coastal area, and 172 families living in the area, was conducted.*

■ Shiba, N., Arai, N., Sakamoto, W., Tubtimsang, W. & Charuchinda, M. 2002. The relationship between shrimp trawl fishing grounds and adult female green turtle in the Gulf of Thailand. In: Proceedings of the 2nd Workshop on SEASTAR2000, pp. 5– 9. *Unavailable.*

■ Tsaros, P. and Aureggi, M. 2007. Interaction between artisan fisheries and sea turtles at Phra Thong island. Naucrates Final report, pp16. http://mangroveactionproject.org/files/map-asia/Fishermen%20-%20Turtle%20Interaction%20Final%20Report.pdf. *Study on interactions between artisanal fisheries and sea turtles. Squid traps, the most common type of fishing gear (68.8%*

of fishermen interviewed), can potentially catch turtles. Whilst only three interviewees mentioned the interaction between traps and turtles, there are several factors which contribute to this concern. The trap stays at sea overnight, with fresh bait, which can attract turtles. The opening (35-40 cm) could allow a young turtle to enter and become trapped. This opening should be reduced to minimize by-catch without reducing the amount of squid caught in trap.

United Arab Emirates (UAE)

N.A.

United Kingdom – BIOT

■ Mortimer, J.A. 2009. History of turtle exploitation in Chagos. Chagos News 34: 14-16 p. *Not available on the Web.*

Tanzania (United Republic of)

■ FAO Workshop. 2006. Assessing the Relative Importance of Sea Turtle Mortality due to Fisheries. Zanzibar, United Rep. of Tanzania, 25 - 28 April 2006. http://www.ioseaturtles.org/UserFiles/File/elec_lib/Mauritius_FAO-ZanzibarWS-April2006.pdf

■ Gjertsen, H., & Niesten, E. 2010. Incentive-based Approaches in Marine Conservation: Applications for Sea Turtles. *Conservation & Society*, *8*(1). http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2010;volume=8;issue=1;spage=5;epage=14;aulast=Gjertsen

■ Moore, J. E., Cox, T. M., Lewison, R. L., Read, A. J., Bjorkland, R., McDonald, S. L., crowder, L. B., Aruna, E., Ayissi, I., Espeut, P., Joynson-Hicks, C., Pilcher, N., Poonian, C.N.S., Solarin, B. Kiszka, J. 2010. An interview-based approach to assess marine mammal and sea turtle captures in artisanal fisheries. Biological Conservation, 143(3), 795-805. http://www.sciencedirect.com/science/article/pii/S000632070900531X. *An intensive pilot study to evaluate whether interview surveys can be effective in assessing fishing effort and threatened species bycatch. In-person surveys were conducted during 2007 and 2008 in fishing communities from seven countries: Sierra Leone, Cameroon, Nigeria, Tanzania, Comoros, Malaysia, and Jamaica.*

■ Muir, C.E. 2005. The status of marine turtles in the United Republic of Tanzania, East Africa. Sea Sense Report (Tanzania Turtle and Dugong Conservation Programme). http://awsassets.panda.org/downloads/statusofturtlesintanzaniafinalreport.pdf. *A report on conservation activities undertaken in Tanzania, community beliefs related to turtles, community knowledge of population trends, threats to turtles, including final recommendations.*

■ Muir, C.E. & O, Abdallah. 2001. Community-based Marine Turtle and Dugong Research & Habitat Protection Programme, Mafia Island. Annual progress report 2001. 10pp. *Not available on the Web.*

■ Sea Sense. 2012. Sea Sense Annual Report: January – December 2012. http://www.seasense.org/fileadmin/documents/reports/Sea_Sense_2012_Annual_Report.pdf

United States - Commonwealth of the Northern Mariana Islands (CNMI)

■ Agrawal, A. & Redford, K. 2006. Poverty, development, and biodiversity conservation: shooting in the dark?, Working Paper No. 26, Wildlife Conservation Society, New York. http://www.forest-trends.org/publication_details.php?publicationID=536 . *This analysis focuses on peer-reviewed writings and finds that 34 of the 37 identified studies share two common features: a focus on processes and outcomes in a single case and single time period, and a drastic simplification of the complex concepts of poverty and biodiversity. In addition, the cases examined are relatively*

inattentive to the relationships between observed outcomes and the contextual features of programmatic interventions. As a result of these shared features, the mass of scholarly work on the subject does not permit systematic and context-sensitive generalizations about the conditions under which it may be possible to achieve poverty alleviation and biodiversity conservation simultaneously.

■ Ferraro, P. J. and H. Gjertsen. 2009. A Global Review of Incentive Payments for Sea Turtle Conservation. Chelonian Conservation and Biology 8(1):48-56. http://www.bioone.org/doi/abs/10.2744/CCB-0731.1. *Article not freely available. This paper describes sea turtle incentive payment initiatives taking place around the world, most of which are found in projects focusing on nesting beach protection. Authors find that many of these initiatives have achieved substantial results for a very low annual cost. The potential for expanding payment incentive schemes beyond nest protection to reduce bycatch and hunting pressures on juvenile and adult turtles is unknown but should be further explored.*

■ Ferraro. 2007. A global survey of sea turtle payment incentive programs. NOAA Paper Global Survey Final Draft. http://www2.gsu.edu/~wwwcec/docs/doc%20updates/NOAA%20Paper%20Global%20Survey%20Final%20Draft%20June%202007.pdf

Viet Nam

■ TRAFFIC Southeast Asia - Indochina. 2004. The trade in Marine Turtle Products in Vietnam. A report prepared for the Marine Turtle Conservation and Management Team, Vietnam. TRAFFIC Southeast Asia. http://www.traffic.org/species-reports/traffic_species_reptiles7.pdf. *A report on the results of a study carried out in 2002 into the status of the trade in marine turtle products in Viet Nam. The study was commissioned to assist the Viet Nam government in the formulation of a National Action Plan on marine turtles.*

■ Stiles, D. 2008. An assessment of the marine turtle products trade in Viet Nam. TRAFFIC Southeast Asia, Petaling Jaya, Selangor, Malaysia. http://assets.peggy.bluegecko.net/downloads/traffic_species_reptiles23.pdf. *This study assesses how well regulation actions from the Vietnamese Government were implemented. In addition, it determines the current status of marine turtle product trade in Viet Nam and assesses trends that have occurred since the 2002 TRAFFIC study was made (TRAFFIC, 2004; van Dijk and Shepherd, 2004).*

■ Van Dijk, P.P. and Shepherd, C.R. 2004. Shelled out? A Snapshot of Bekko Trade in Selected Locations in South-east Asia. TRAFFIC Southeast Asia. http://www.traffic.org/species-reports/traffic_species_reptiles6.pdf. *TRAFFIC Southeast Asia carried out surveys in two traditionally key countries involved in the shell products, or bekko, trade, Indonesia and Vietnam, in Sept/Oct 2001 and Feb 2002 to establish the status of trade and stockpiles of bekko in selected locations.*

■ WWF. 2007. Improving the Knowledge Base and Identifying Management Options for the Reduction of Sea Turtle Interactions in Vietnamese Fisheries ("By-catch project"). Phase one. *Unavailable. This report focuses on the identification of geographic "hotspot" and relative impacts of different gear types and source provinces with respect to sea turtle mortality inside Vietnamese waters. (2006-2007).*

Yemen

N. A.

All IOSEA countries

■ Ali, A., Talib, Z., Mohd Isa, M., Razak, S.A., Azman Zakaria, N. 2004. A guide to set-up and manage sea turtles hatcheries in the Southeast Asian region. SEAFDEC. *Not available on the Web*

(paper version at IOSEA Secretariat). This book is the outcome of a project on Conservation and Management of Sea Turtles in Southeast Asian Countries conducted from 2001 until 2003. The project was led by the Marine Fishery Resources Development and Management Department of Malaysia, Southeast Asian Fisheries Development Center (SEAFDEC-MFRDMD) in Terengganu, Malaysia and was financially supported by the Japanese Government under the ASEAN-SEAFDEC Fisheries Consultation Group Mechanism.

WIOMSA countries: Kenya, Tanzania, Mozambique, South Africa, Madagascar, Comoros, Seychelles, Mauritius, La Reunion.

■ Kiszka, J., Muir, C. (Eds.), 2007. Incidental catch of non-targeted marine species in the Western Indian Ocean: problems and mitigation measures. Workshop proceeding. 13-15th November 2006, Mayotte, France. 111 p. http://www.researchgate.net/publication/235624009_Bycatch_of_non-targeted_marine_species_in_the_western_Indian_Ocean/file/d912f511f8a339dc22.pdf.

FAO project countries: Kenya, Madagascar, Mauritius, Maldives, Mozambique, Seychelles, Somalia, South Africa, Reunion, Tanzania and Yemen

■ Bourjea, J., Nel, R., Jiddawi, N. S., Koonjul, M. S., & Bianchi, G. 2008. Sea turtle bycatch in the West Indian Ocean: review, recommendations and research priorities. Western Indian Ocean Journal of Marine Science, 7(2), 137-150. http://www.researchgate.net/publication/232416462_Sea_Turtle_Bycatch_in_the_West_Indian_Ocean_Review_Recommendations_and_Research_Priorities/file/9fcfd5084d77cf235a.pdf. *Within the framework of the FAO project GCP/INT/919/JPN and a review of published or available data, the relative importance of fishery-related sea turtle mortality in the West Indian Ocean region was assessed for Kenya, Madagascar, Mauritius, Maldives, Mozambique, Seychelles, Somalia, South Africa, Reunion, Tanzania and Yemen.*

■ FAO. 2013. Workshop on Bycatch Management and Low Impact Fishing. Fao Fisheries and Aquaculture, 120 pages. *Not available on the Web.*

■ FAO. 2009. FAO South West Indian Ocean Fisheries Commission. Report of the Workshop on Bycatch, Particularly in Prawn Fisheries, and on the Implementation of an Ecosystem Approach to Fisheries Management. Maputo, Mozambique, 15–24 November 2005. FAO Fisheries and Aquaculture Report. No. 873. Rome, 47p. ftp://ftp.fao.org/docrep/fao/011/i0554e/i0554e00.pdf

■ FAO. 2007. Report of the Workshop on Assessing the Relative Importance of Sea Turtle mortality due to fisheries in Southeast Asia. Meeting report 2. GCP/INT/919/JPN. Bangkok, Thailand, 19-23 March 2007. *Not available on the Web (paper version at IOSEA Secretariat).*

■ FAO. 2004. Report of the technical consultation on sea turtles conservation and fisheries. FAO fisheries report No. 765. Sea FIRM/R765. Bangkok, Thailand, 29 November – 2 December 2004. *Not available on the Web (paper version at IOSEA Secretariat).*

Worldwide papers

■ Cornelius, S.E, R. Arauz, J. Fretey, M.H. Godfrey, R. Márquez-M & K. Shanker. 2007. Effect of land-based harvest of Lepidochelys. In: Biology and Conservation of ridley turtles (eds. P. Plotkin and S. Morreale). Johns Hopkins Press, USA. http://bit.ly/cuEOL3. *This chapter reviews the nature of exploitation at ridley nesting beaches and explores its impacts on regional population and by extension, on the global survival of the species.*

■ Mascia MB, Brosius JP, Dobson TA et al. 2003. Conservation and the social sciences. Conserv Biol 17(3):649–650. http://www.arcticcentre.org/loader.aspx?id=922decd6-2ad7-4d0c-9559-b5e16ef8a1db

■ Tisdell C, Wilson C. 2003. Does Ecotourism Contribute to Sea Turtle Conservation? Is the Flagship Status of Turtles Advantageous? Working Paper No. 90. "Economics, Ecology and the Environment", December 2003, The University of Queensland. http://ageconsearch.umn.edu/bitstream/48971/2/WP90.pdf.

Part II

Australia

■ ABC Documentary. 2009. Ghosts of the Gulf. *This film showcases the work done by Indigenous rangers attached to the Ghost Net Programme.*

■ Gunn, R., Hardesty, B.D. and Butler, J., (2010) Tackling 'ghost nets': Local solutions to a global issue in northern Australia. Ecological Management & Restoration, 11:88-98. http://onlinelibrary.wiley.com/doi/10.1111/j.1442-8903.2010.00525.x/abstract. *Not freely available on the Web. This paper adresses the problem of managing ghost nets. It describe the inception and development of the Carpentaria Ghost Nets Programme, involving more than 18 Indigenous communities and over 90 Indigenous rangers. The project aims to address the fundamental issue of tackling the ghost nets problem at its source through cross-cultural interactions between rangers and fishermen, increasing public, political and economic awareness, and ultimately reducing the incidental and intentional loss of fishing nets that act as ghost nets and result in tremendous biological, cultural and economic impacts.*

■ Harris, A.N., Bishop, M, Skewes, T.D., Dews, G.J. and Pitcher, C. R. 1997. Transfer of traditional fisheries monitoring in Torres Strait to the Australian Fisheries Management Authority, with training. Report on CSIRO Research 1993-1996. Final report to the Scientific Advisory Committee of the Torres Strait Protected Zone. March, 1997. http://www.cmar.csiro.au/datacentre/torres/AFMA1980_2003/DVDVer101/Reports/r416.pdf. *This study is the result of a joint AFMA/CSIRO project that monitored the traditional marine catch of the Torres Strait Protected Zone (TSPZ), including marine turtles. The project employed a fisheries observer to collect information from all islands using a frame survey method previously developed in the Torres Strait by CSIRO. Catch sampling was carried out between December 1993 and December 1994 and from December 1995 until the end of this project in June 1996.*

■ Wirsing, A. J., K. Crane, M. R. Heithaus, D. Charles, and L. M. Dill. 2004. Pilot study of loggerhead turtles in the Shark Bay World Heritage Area: Movements and community based conservation. Final report to the Department of the Environment and Heritage. Shark Bay District, Department of Conservation and Land Management, 89 Knight Terrace, Denham, Western Australia, 6537. http://www.environment.gov.au/coasts/publications/pubs/loggerhead-shark-bay2004.pdf. *Final report of a program that was run collaboratively with the Yadgalah Aboriginal Corporation, which represents indigenous interests in the SBWHP. Following its completion, the groups involved proposed the loggerhead turtle as a species of international conservation significance that could serve as the focus of additional work designed to strengthen the relationship between the Western Australian Government and the local indigenous community.*

■ *Torres Strait Regional Authority (TSRA) is supporting the design and development of a Traditional Ecological Knowledge system in Torres Strait to enable Rangers' cultural and natural resource management activities to be informed by Ailan Kastom (Island Custom). The project will allow for cultural datasets to complement other western scientific datasets through a geospatial, computer based system, with associated mechanisms to ensure that culturally sensitive data and Indigenous intellectual property rights are appropriate protected. The project is funded under the Australian Government's Caring for our Country program until June 2013. Rangers are conducting catch monitoring of marine turtles. The data are stored under an agreement with traditional owners regarding its usage and dissemination. Data are being collected on a voluntary basis. While an accurate account of the turtle harvest in the region is unlikely to be determined in the short-term, the*

catch-estimates should improve over time, with increased participation in the catch-monitoring program. (Source: IOSEA NR). Database not yet available. See https://fieldcapture.ala.org.au/project/index/0e980f48-33d4-4dbf-8334-ca3f4d3ff53e

■ WWF National Marine Debris database collecting survey data from the beach cleaning component of the government - led Northern Territory Marine Debris Surveys project. Database not found on the Web. Reports from 2001 to 2004 activities available at: http://www.wwf.org.au/our_work/saving_the_natural_world/oceans_and_marine/marine_threats/pollution/tracking_program/.

■ Zurba, M. 2009. Bringing local synthesis into governance and management systems: the Girringun TUMRA case in Northern Queensland, Australia. Journal of the Royal Society of New Zealand, 39:179-182. http://www.tandfonline.com/doi/pdf/10.1080/03014220909510575. *Describes the TUMRAs management system.*

Bahrain

■ *Abdulqader et al. (2004) conducted a socio-economic survey on all fishery sectors, including shrimp fishery. (Source: IOSEA NR). Not found on the Web.*

Bangladesh

■ BOBLME. 2011. Country report on pollution in the BOBLME – Bangladesh. BOBLME-2011-Ecology-01. http://www.boblme.org/documentRepository/BOBLME-2011-Ecology-01.pdf

■ BOBLME. 2010. BOBLME National Inception Workshop- Bangladesh 6-7 January 2010 BRAC Centre Inn, Dhaka, Bangladesh. BOBLME-2010-Project-01: "alternative income generating opportunities of the coastal fishing communities are very limited" (BoBLME 2010, p 38). http://www.boblme.org/documentRepository/BOBLME-2010-Project-01.pdf

■ CWBMP. 2006a. St Martin's Island ECA Draft Conservation Management Plan Coastal and Wetland Biodiversity Management Project BGD/99/G31. http://www.doe-bd.org/cwbmp/cwbmp_pdf/draft_st_martin_island_cmp040906.pdf

■ CWBMP. 2006b. Sonadia Island ECA Draft Conservation Management Plan Coastal and Wetland Biodiversity Management Project BGD/99/G31. http://www.doe-bd.org/cwbmp/cwbmp_pdf/draft_sonadia_island_eca_cmp040906.pdf

■ CWBMP. 2006c. Teknaf Peninsula ECA Draft Conservation Management Plan Coastal and Wetland Biodiversity Management Project BGD/99/G31. http://www.doe-bd.org/cwbmp/cwbmp_pdf/draft_teknaf_peninsula_cmp040906.pdf

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■ Islam. 2009. Marine Conservation Initiative along Cox Bazar Coast, Bangladesh. Paper presented at the annual meeting of the International Marine Conservation Congress, George Madison University, Fairfax, Virginia Online <PDF>. 2013-05-05 from http://citation.allacademic.com/meta/p296648_index.html

■ Islam, M. Z., M. S. Islam and S. M. A. Rashid. 1999. Marine turtle conservation program in St. Martin's Island, Bangladesh by CARINAM: A brief review. Tigerpaper. 26: 17-28. *Not found on the web.*

■ *Socio-economic studies were carried out for St. Martin's Island under NCSIP-1 (1996), under St. Martin's Project (2002), and under the CWBMP (2005) project. Corresponding reports could not be identified.*

Cambodia

■ Sereywath, P., Sokhannaro, H. 2003. Seagrass meadow and green turtle in Cambodia. Proceedings on the 4th SEASTAR2000 Workshop 36-39. http://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/44128/1/4thSEASTAR2000_36.pdf. *This study reports surveys on seagrass species conducted in 2002 in Koh Kong Province, Kampot Province and Kep Municipality, involving interviews of local people who are living in seagrass areas that are marine turtle habitats.*

■ Sereywath, P. 2002. Past and ongoing sea turtle conservation program in Cambodia. In Proceedings of the 3rd Workshop on SEASTAR2000 129-134. http://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/44173/1/3rdSEASTAR2000_129.pdf. *This study identifies human threats to sea turtle populations in Cambodia, as well as management interventions and education activities that have taken place in Cambodia up to 2002.*

Comoros

■ C3 Comoros. 2007. Turtle information centre and awareness-raising campaign Moheli, Comoros. A report submitted to UNEP/IOSEA Marine Turtle MoU Secretariat. 1-36 p. http://issuu.com/chrisc3/docs/2008-09-27_c3-comores-2007-iosea-final-report. *Reports support provided to ADSEI association to organize the 2006 Day of the Turtle, the drawing competition and the creation of the Turtle Awareness Centre.*

■ Granek, E. F., & Brown, M. A. 2005. Co-Management Approach to Marine Conservation in Mohéli, Comoros Islands. Conservation biology, 19(6), 1724-1732. http://onlinelibrary.wiley.com/doi/10.1111/j.1523-1739.2005.00301.x/abstract. *Not freely available on the Web. A year-long evaluation of the park implementation process, including community and fisher participation.*

■ Gruelich, A. 2001. Etude des populations de tortues vertes sur l'ile de Moheli (Comoros). Resultats preliminaires du suivi effectue a Itsamia de mars 2000 a mars 2001 (CEDTM / IFREMER). 1-23 p. http://www.ioseaturtles.org/bibliography_search_detail.php?id=433.

■ Hauzer, M., Poonian, C., Moussa Iboura, C. 2008. Mohéli marine Park, Comoros – Successes and challenges of the co-management approach. Ten years after bleaching – facing the consequences of climate change in the Indian Ocean. Status Report. http://www.c-3.org.uk/pdf/Hauzer_et_al_2008_CORDIO.pdf. *This study aimed to ascertain stakeholders' current perceptions of the Park, using focus group interviews to evaluate six key parameters.*

■ Project Biodiversity. 2000. Conservation action plan for marine turtles in the Federal Islamic Republic of the Comoros. Projet Conservation de la Biodiversite et Developpement Durable (PNUD/FEM). 1-20 p. http://www.ioseaturtles.org/bibliography_search_detail.php?id=111

■ UNDP. 2012. Mohéli Marine Park, Comoros. Equator Initiative Case Study Series. New York, NY. http://www.equatorinitiative.org/images/stories/winners/106/casestudy/case_1348163266.pdf. *A performance evaluation of the Moheli Marine Park Management.*

Eritrea

■ *ECMIB: A survey was conducted by a sea turtle team within four Egyptian vessels from 09/12/04 to 12/02/05 to assess the potential threat to sea turtles from fish and shrimp trawlers. Field Report unavailable. During the trawling operations overall 21 sea turtles were incidentally caught, one green turtle was found dead and the rest were alive. At most three to four per year are caught entangled in drifting nets set by a group of fishermen. In addition, a questionnaire survey (100 respondents) was conducted between April and June 2004 by the ECMIB Turtle Survey Team. Unpublished. (Source: IOSEA NR).*

France

■ Ballorain K., Nivert, N. 2009. L'évolution statutaire de Mayotte et les enjeux environnementaux : l'exemple de la protection des tortues marines. Revue juridique de l'Océan Indien, 9: 107-135. http://www.rjoi.fr/index.php?id=1006. *Not freely available on the Web.*

■ Broussy E. 2007. Réhabilitation d'un site de ponte à la réunion : plage de Kélonia (Réhabiliter un site de ponte pour les tortues marines réunionnaises.). Kélonia. Collège de la pointe des châteaux. 2005. *Reference not found on the Web.*

■ Clermont S., Chavance, P., Delgado, A., Murua, H., Ruiz J., Ciccione, S and Bourjea, J. 2012. EU purse seine fishery interaction with marine turtles in the Atlantic and Indian Oceans: a 15 year analysis. IOTC 2012 WPEB08 35_V2. http://www.iotc.org/files/proceedings/2012/wpeb/IOTC-2012-WPEB08-35%20Rev_1.pdf

■ Ciccione S., Lauret-Stepler M., Bourjea J. 2008. Marine turtle nest translocation due to hurricane on Reunion Island. Marine Turtle Newsletter, 119: 6-8. http://www.seaturtle.org/mtn/archives/mtn119/mtn119p6.shtml.

■ Dalleau, M., S. Benhamou, J. Sudre, S. Ciccione and J. Bourjea. 2013. Movement and diving behavior of late juvenile loggerhead sea turtles (*Caretta caretta*) in the Western Indian Ocean. IOTC-2013-WPEB09-26. http://www.iotc.org/files/proceedings/2013/wpeb/IOTC-2013-WPEB09-26%20-%20Movement%20loggerheads.pdf. *Authors conducted a satellite tracking study on juvenile loggerhead sea turtles in the Indian Ocean, where they have been poorly studied up to date. Eighteen individuals were released from Reunion Island (21.2°S, 55.3°E) to investigate movement and diving patterns of late juvenile stage in the region. Eleven turtles roughly swam towards Oman (20.5°N, 58.8°E), where one of the world largest rookery of loggerheads is located. Three individuals contrastingly went southwards off the coast South-Africa and Madagascar, countries that also host loggerhead nesting grounds. Fourteen transmitters allowed the processing of animal diving profile and we observed a dichotomy between diurnal and nocturnal diving behavior with a greater number of shorter dives occurring during the day. Diving behavior also differed according to movement behavior as individuals spent more time at subsurface (<10m) during transit phases. This study provides a better understanding of the oceanic movements and diving behavior of juvenile loggerheads, and key information for conservation of this species, which is of major concern in the Indian Ocean and worldwide.*

■ Pochon A. 2007. Expérimentation de la photo identification comme mode de suivi individuel sur les tortues marines de l'herbier de N'Gouja. Kélonia. http://www.ioseaturtles.org/bibliography_search_detail.php?id=18. *Unavailable.*

■ Ramanitra F. 2004. Mayotte /Saziley: Protection et valorisation d'un site de ponte aux travers d'enjeux de développement. Kélonia. *Reference not found on the Web.*

■ Vacher S. 2002. Journée de la tortue à Mayotte 6-9 décembre 2002. Kélonia. *Reference not found on the Web.*

India

■ Aleya, K. 2005. Initiatives towards Consensus - the Orissa Marine Resources Conservation Consortium. Indian Ocean Turtle Newsletter No. 1. http://www.iotn.org/pdf/IOTN1_7.pdf. *This article describes the OMRCC, a voluntary and non-official sea turtle conservation consortium in Orissa, formed in December 2004 by divergent groups comprising conservationists, biologists, fisherfolk NGOs and other interested persons.*

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■ Chadha, S.K. & Mohanty, B. 2001. The management of olive ridley sea turtles at Devi river mouth, Orissa. Kachhapa 5: 24. *Not found on the Web.*

■ Choudhury, B.C. 2003. Editorial: TEDs in India: from conflict to consultation. Kachhapa 8: 1-2. http://www.iotn.org/pdf/kachhapa/kachhapa8.pdf. *A report on the acceptance of TEDs by Indian fishermen.*

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■ Dongre, S. K. M. 2003. School Education to support sea turtle conservation: Experiences from Goa and Orissa. Kachhapa 8. http://www.iotn.org/pdf/kachhapa/kachhapa8.pdf

■ Kar, S.K., C.S. Kar & S.K. Patnaik. 1998. Biodiversity conservation in Bhitarkanika mangrove ecosystem of Orissa, India: problems and prospects. In: Biodiversity Conservation: Problems and Prospects (ed. H.K. Patra), pp. 68-74. Orissa Environmental Society Publication, Bhubaneswar, Orissa, India. *Not found on the Web.*

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■ Mohanty-Hejmadi, P. 2001. The history of sea turtle conservation in Orissa. In: Proceedings of the Workshop for the development of a National Sea Turtle Conservation Action Plan, Bhubaneswar, Orissa (eds. K. Shanker & B.C. Choudhury), pp. 4-8. Wildlife Institute of India, Dehradun. *Not found on the Web.*

■ Pandav, B. 2000. Conservation & management of olive ridley sea turtles on the Orissa coast. PhD thesis. Utkal University, Bhubaneswar, India. *Not found on the Web.*

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■ Pattanaik, S. K., Kar, C. S. and Kar, S. K., 2001. A Quarter Century of Sea Turtle Conservation in Orissa, Forest Department, Govt of Orissa Publ., Bhubaneswar,,pp. 1–34. *Not found on the Web.*

■ Patnaik, S.K. & C.S. Kar. 2000. Status and conservation of sea turtles in Orissa, India. In: Sea turtles of the Indo-Pacific: Research, Conservation and Management (eds N.J. Pilcher & G. Ismail), pp. 13-24. ASEAN Academic Press, London. http://www.arbec.com.my/sea-turtles/art2julysept01.htm.

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■ Shanker, K. & B. Wright. 2000. Editorial: Operation Kachhapa: New problems, new solutions? Kachhapa 2: 1. http://www.seaturtlesofindia.org/downloads/Shanker&Wright_2000.pdf

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■ Shenoy, S, N. Namboothri, T. Berlie and K. Shanker. 2010. Building a network for conservation of marine turtles in India. Project report submitted to the USFWS. Ashoka Trust for Research in Ecology and the Environment, Bangalore. 57p. *Not found on the Web.*

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■ Suarez, A & Starbird, CH. 1996. Subsistence hunting of leatherback turtles (Dermochelys coriacea) in the Kai Islands, Indonesia. Chelonian Conservation and Biology, 2(2):190-195. Book. *Not found on the Web.*

■ *SWFSC: the US Southwest Fisheries Science Center conducted research from 2004-2008 on the economics of Pacific leatherback conservation. This included assessing the costs and benefits and community incentives of nesting beach conservation projects in Malaysia, Indonesia, Papua New Guinea, the Solomon Islands, and Vanuatu. Interviews were conducted with project staff from all the above countries. The following publications resulted from these efforts:*

- Ferraro, P. J. and H. Gjertsen. 2009. A Global Review of Incentive Payments for Sea Turtle Conservation. Chelonian Conservation and Biology 8(1):48-56. http://www.bioone.org/doi/abs/10.2744/CCB-0731.1. *Article not freely available. This paper describes sea turtle incentive payment initiatives taking place around the world, most of which are found in projects focusing on nesting beach protection. Authors find that many of these initiatives have achieved substantial results for a very low annual cost. The potential for expanding payment incentive schemes beyond nest protection to reduce bycatch and hunting pressures on juvenile and adult turtles is unknown but should be further explored.*
- Gjertsen, H. 2009. Can We Improve our Conservation Bang for the Buck - Cost Effectiveness of Alternative Leatherback Turtle Conservation Strategies. In Conservation of Pacific Sea Turtles. Dutton, P. H., D. Squires, and M. Ahmed (Eds.) University of Hawaii Press. In press.
- Gjertsen, H. and T. Stevenson. 2009. Direct Incentive Approaches for Leatherback Turtle Conservation. In Conservation of Pacific Sea Turtles. Dutton, P. H., D. Squires, and M. Ahmed (Eds.) University of Hawaii Press. http://www.academia.edu/2892232/Direct_incentive_approaches_for_leatherback_turtle_conservation

- Gjertsen, H., P. H. Dutton, and D. Squires. 2009. Conservation of the Leatherback Sea Turtle in the Pacific. In Handbook of Marine Fisheries Conservation and Management. Grafton, Q. and D. Squires (Eds.) Oxford University Press. In press.
- Gjertsen, H. and C. Hitipeuw. 2006. Using Socioeconomic Surveys to Design Community Incentives for Conservation. In Book of Abstracts from 26th Annual Symposium on Sea Turtle Biology and Conservation. Frick, M., A. Panagopoulou, A. F. Rees, and K. Williams (Eds.) International Sea Turtle Society, Athens, Greece, p. 346. *Unavailable*.

■ WWF – Indonesia. 2004. Case study 1: green turtle consumption in Bali, Indonesia. *In* Troëng S, Drews, C. 2004. Money talks: Economic aspects of marine turtle use and conservation. http://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Meeresschildkroeten_Money_Talks_Studie_04.pdf. *Bali, Indonesia is one of the world's largest markets for marine turtles. Many Moslems in Southeast Asia do not consume the meat from marine turtles. However, green turtle meat and products are often used in Hindu rituals and for communal meals in Bali. Green turtles are caught elsewhere in Indonesia and brought to Bali for sale.*

■ *A study conducted by Waayers (2001) explored the potential for developing turtle-based tourism in Bali, by establishing whether tourists are actually interested in participating in turtle-based tourism, and whether the tour operators based in Bali are willing to integrate turtle tours into their business. The results indicated that the majority of tourists were willing to participate in tourism based on marine turtles in Bali, whilst operators were open to including marine turtle tourism as a specific tour. However, several tour operators were reluctant to undertake turtle tours because of their lack of knowledge of marine turtle biology and behaviour and the unreliability of sightings of nesting female turtles. The study could not be identified.*

Iran (Islamic Republic of)

■ UNDP/GEF/SGP. Onshore Preservation of Hawksbill Turtle Eggs through Community Participation, IRAN (IRA-G52-2003, 2004 & 2007-024(IRA98G52). http://www.undp.org.ir/doccenter/qeshm/turtle-qeshm.pdf

■ Mobaraki, A. 2004. Green Turtle Nesting on the Gulf of Oman Coastline of the Islamic Republic of Iran. Marine Turtle Newsletter 104:11. http://www.seaturtle.org/mtn/archives/mtn104/mtn104p11.shtml. *Study conducted in the Oman Sea area, where local people and fishermen were asked about sea turtles in the area in a simple questionnaire.*

Jordan

■ PERSGA/GEF. 2004. Regional Action Plan for the Conservation of Marine Turtles and their Habitats in the Red Sea and Gulf of Aden. PERSGA, Jeddah. http://www.persga.org/Documents/2_MarineTurtles_ActionPlan.pdf

PERSGA. 2003. Status of marine turtles on the Yemeni coast. PERSGA, Jeddah. Unavailable. *Surveys led by regional specialists that determined the marine turtle populations and habitat status. PERSGA compiled all data collected for its science, research and monitoring activities into a comprehensive GIS database.*

Kenya

■ Cinner, J. and McClanahan, T. R. 2006. A baseline socioeconomic assessment of fishing communities along the north coast of Kenya. Wildlife Conservation Society, Mombasa, Kenya. *Not freely available on the Web.*

■ Kaloki, F., Wamukoya, G.M. 1996. Local community participation in sea turtle conservation in Kenya. 27-29 p. In: Humphrey, S.L., Salm, R.V. (Eds.), Status of sea turtle conservation in the

Western Indian Ocean. IUCN/UNEP, Nairobi, Kenya. http://iwlearn.net/publications/regional-seas-reports/unep-regional-seas.../file

■ *KESKOM: 2003: the UNDP GEF Small Grants Program provided financial support to KESCOM to enhance sea turtle conservation and management activities in Kenya. The project was to be implemented in four phases by KESCOM in collaboration with its community based sea turtle conservation groups and relevant institutions.*

- KESCOM 2005. Enhancing the conservation and management of sea turtles in Kenya. 1-81 p. *The first project schedule was completed in May 2004. The reporting period is based on the conservation action undertaken between August 2004 and April 2005, during the second disbursement schedule. Within this period KESCOM focused on four main conservation and management areas which included, patrols and monitoring of sea turtle activity, habitat rehabilitation focusing on mangrove replanting and beach clean-ups, participatory rural appraisals and a research survey on nesting sites which are not listed under KESCOM's national monitoring program.*
- Gakuo, A.M. 2009. Advances in sea turtle conservation in Kenya. 1-4 p. *Unavailable. Report on beach clean-ups and mangrove replanting initiatives in Kenya being undertaken mainly by local communities under KESKOM projects.*

■ Mueni, E., Mwangi, J. 2001. A survey on the use of a turtle excluder device (TED) on the Kenyan Coast. Kenya Wildlife Service Technical Series. *Not found on the Web.*

■ Munga C. N., Mohamed M. O. S., Obura D. O., Vanreusel A. and Dahdouh-Guebas F. 2010. Resource Users' Perceptions on Continued Existence of the Mombasa Marine Park and Reserve, Kenya. Western Indian Ocean J. Mar. Sci. Vol. 9, No. 2, pp. 71 – 80. http://www.vub.ac.be/APNA/staff/FDG/pub/Mungaetal_2010_WIndOceanJMarSci.pdf. *Findings: All fishermen (100%) were negative regarding the MMP&R's continued existence but the majority of the other resource users were positive to a varying degree.*

■ Nzuki, S., Muasa, J. 2005. Participatory habitat characterization and GIS database development for the conservation and management of sea turtles in south coast Kenya. Report Number WIOMSA/MARG-I/2005-04. 1-24 p. http://www.oceandocs.org/bitstream/1834/1460/1/2006714172416117Simon%2520Nzuki%2520final%2520Marg-1%2520Report.pdf

■ Wamukota, A. 2005. Using a rights-based approach to conserve natural resources: The case of sea turtles. 1-4 p. In: Wakwabubi, E., Matendo, L. (Eds.), Institutionalising rights in development through citizen participation: Case studies from Kenya, Uganda and Zimbabwe. Participatory - Methodologies Forum of Kenya (PAMFORK), Nairobi. *Published book not freely accessible on the Web.*

■ Wamukoya, G.M., Mbendo, J.R. and Eriya, J. 1998 Bycatch in shrimp trawls in Kenya with specific reference to sea turtles. 14 - 15 p. In: IUCN East Africa Programme, Report of the Western Indian Ocean turtle excluder device (TED) training workshop. http://mtsg.files.wordpress.com/2010/07/wio_ted_workshop.pdf. *Presentations, discussions, and commitments of participants during a Turtle Excluder Device (TED) training workshop held in Mombasa, Kenya in January 1997 by the IUCN East Africa Regional Office in collaboration with the IUCN Marine Turtle Specialist Group. The workshop was attended by 41 participants from Eritrea, Kenya, Madagascar, Mozambique, Tanzania and the USA.*

■ *WATAMU: 1998: compensatory release programme for sea turtles incidentally caught by local artisanal fishers in the Watamu area.*

- Oman, R. Project profile: Local ocean trust: Watamu turtle watch sea turtle conservation in the Indian Ocean. Indian Ocean Turtle Newsletter No. 17. JANUARY 2013. http://www.iotn.org/iotn-17-8.php
- Zanre, R. 2005. Report on Watamu Turtle Watch's sea turtle bycatch release programme, Watamu, Kenya: April 1998 - May 2004. 1-87 p. http://www.ioseaturtles.org/UserFiles/File/elec_lib/Watamu_turtle_watch_report.pdf. *This*

report examines the programme and its context, research data collected, the programme's value as a viable sea turtle conservation activity and implications for sea turtle conservation policy in the region.

■ WCS Project on coral reefs: 2011 "Developing an implementation strategy to prepare the management and conservation of coral reefs in the western Indian Ocean from climate change". *Socio-economic surveys were conducted for the community managed areas in southern Kenya: questionnaires, semi-structured and key informant interviews and focus group discussions, transect walks, participant observations and analysis of secondary information w Aims: determine threats and pressures on resources; assess community dependency on coral reefs; assess the quality of life of local communities and how management intervention may affect their livelihoods; and understand community perceptions about management and resource use. This study included marine turtles in its scope.*

Weru, S. 2005. WWF Kiunga marine turtle conservation programme. 11-12 p. In: Humphrey, S.L., Wilson, A. (Eds.), Marine turtle update: Recent news from the WWF Africa and Madagascar marine turtle programme. http://awsassets.panda.org/downloads/marineturtleupdate_nov05.pdf.

Madagascar

■ Andriantahina F (1999) Conservation de la tortue caouanne *Caretta caretta* ou « fanomena » dans le Sud-Est de Madagascar. Rapport préliminaire. WWF, Madagascar. *Unavailable.*

■ Belle, E., Gerard W. Stewart, Benjamin De Ridder, Roberto J. - L. Komeno, Frédéric Ramahatratra, Brice Remy-Zephir, and Roderick D. Stein - Rostaing 2009. Establishment of a community managed marine reserve in the Bay of Ranobe, southwest Madagascar. Madagascar conservation & development 4(1):31-37. http://www.reefdoctor.org/wp-content/uploads/Belle-et-al.-2009.pdf. *ReefDoctor's scientific paper on the implementation of the Massif des Roses marine reserve.*

■ Andriamalala, G., Gardner, C. J. 2010. L'utilisation du dina comme outil de gouvernance des ressources naturelles : leçons tirés de Velondriake, sud-ouest de Madagascar. Blue Ventures. http://blueventures.org/images/stories/bv/research/resreports/Andriamalala__Gardner_using_dina_for_governance_of_natural_resources.pdf. *This paper describes and critically analyses the establishment and enforcement procedures of a dina created to govern resource use within Velondriake, a community-managed marine protected area in southwestern Madagascar.*

■ Blue Ventures. 2010. Using community members to assess artisanal fisheries: the marine turtle fishery in Madagascar, Sept. 2010. http://onlinelibrary.wiley.com/doi/10.1111/j.1469-1795.2010.00413.x/abstract. *Using community members to collect data can provide access to a greater wealth of information than that obtained by local or foreign researchers, often at a reduced financial cost, authors monitored the harvest of marine turtles at 12 major villages in Madagascar using community members as data collectors (sous collecteurs) from each village, at a total cost of <US$3000 for 1 year.*

■ Lilette, V. 2006. Mixed results: Conservation of the marine turtle and the red-tailed tropicbird by Vezo semi-nomadic fishers. Conservation and Society 4: 262-286. http://www.conservationandsociety.org/article.asp?issn=0972-4923;year=2006;volume=4;issue=2;spage=262;epage=286;aulast=Lilette. *A study of the perceptions of the Vezo people in relation to the conservation of marine turtles (specifically the green turtle) and the effect of traditional, economic and social factors on the success of conservation efforts.*

■ Mayol, T.L. 2013. Madagascar's nascent locally managed marine area network. Madagascar Conservation & Development 8:2. http://www.journalmcd.com/index.php/mcd/article/view/mcd.v8i2.8

■ Rafaeliarisoa C. 2009. Les tortues marines de Nosy Iranja: Études bio-eligiques de la ponte et enquetes socio-economiques dans le Nord-Ouest de Madagascar. Rapport preliminaire. Included interviews of fishermen. *Report not found on the Web.*

■ Rakotoson, L.R. and Tanner, K. 2006. Community-based governance of coastal zone and marine resources in Madagascar. Ocean and Coastal Management 49: 855 - 872. http://www.sciencedirect.com/science/article/pii/S0964569106001141. *Importance of incorporating Dina into current governmental laws, to ensure compliance by local communities, also in terms of the regulation of marine resources.*

■ SEE. Ongoing: Socio-economic surveys, assessing current fishing practices and their impacts on marine ecosystems. http://seeconservation.org/Madagascar%20Marine.html. *Unpublished.*

■ Wilson, A., Humphrey, S. 2004. Marine turtle update: Recent news from the WWF Africa and Madagascar Marine Turtle Programme. 1-16 p. http://assets.panda.org/downloads/africanmarineturtleupdate1.pdf. *Training of crew to monitor and tag turtles caught as by-catch*

Malaysia

■ Chan, E.H. 2004. Turtles in Trouble. Siri Syarahan Inaugural KUSTEM: 7 (2004). Kolej Universiti Sains dan Teknologi Malaysia (now known as Universiti Malaysia Terengganu). ISBN 983-2888-07-7. http://www.turtleconservationsociety.org.my/wp-content/uploads/files/TurtlesInTrouble.pdf. *This paper examines the status of turtles in Malaysia, highlights factors that threaten their survival and assess conservation efforts in practice in the country.*

■ Chan, E.H. and H.C. Liew. 2002. Raising funds and public awareness in sea turtle conservation in Malaysia. Proc. 20th Ann. Symp. Sea Turtle Biology and Conservation. NOAA Technical memorandum NMFS-SEFSC-477. *Not found on the Web. Describes how the long-term tagging and in-situ incubation project conducted by the Turtle Research and Rehabilitation Unit of Kolej Universiti Sains dan Tekrologi Malaysia (KUSTEM) has developed a successful volunteer programme through which members of the public were given an insight and hands-on experience in a grass-roots turtle conservation project.*

■ Chan, E.H. and H.C. Liew. 1999. Public participation in the conservation of sea turtles in Pulau Redang, Malaysia. Proc. Int. Workshop on the Migration, Foraging Habitats, and Nesting Ecology of marine Turtles in Taiwan, 12-14 April 1999, Taipei, Taiwan. N*ot found on the Web.*

■ Chan EH, Liew HC, Devaux B. 1995. In-situ incubation of green turtle eggs in Pulau Redang, Malaysia: hope after decades of egg exploitation. Proceedings of International Congress of Chelonian Conservation. 6th to 10th of July 1995. pp 68-72. *Not available on the Web.*

■ *Marine Research Foundation: 2012 - ongoing Research on Impacts of Blast Fishing on Sea Turtles.* http://www.mrf-asia.org/projects_view.cfm?THE_ID=38

■ *SEAFDEC: 1998 - 2004. The programme "Conservation and Management of Sea Turtles in Southeast Asian Countries" was initiated in 1998, in line with the response to the 1997 US embargo. Three marine turtle projects were carried out, focusing on hatchery management studies, a tagging survey, Turtle Excluder Devices and Juvenile and Trash Excluder Devices. Each project consisted of research, training, and information and extension activities. Publications not identified.*

■ *SWFSC: the US Southwest Fisheries Science Center conducted research from 2004-2008 on the economics of Pacific leatherback conservation. This included assessing the costs and benefits and community incentives of nesting beach conservation projects in Malaysia, Indonesia, Papua New Guinea, the Solomon Islands, and Vanuatu. Interviews were conducted with project staff from all the above countries. In addition, the SWFSC collaborated with the WorldFish Center, World Wildlife Fund, and Department of Fisheries (DOF) Malaysia, to conduct surveys with fishermen in Malaysia to assess sea turtle bycatch and costs and earnings from fishing. The following publications resulted from these efforts:*

- Ferraro, P. J. and H. Gjertsen. 2009. A Global Review of Incentive Payments for Sea Turtle Conservation. Chelonian Conservation and Biology. (In press.)

- Gjertsen, H. 2009. Can We Improve our Conservation Bang for the Buck - Cost Effectiveness of Alternative Leatherback Turtle Conservation Strategies. In Conservation of Pacific Sea Turtles. Dutton, P. H., D. Squires, and M. Ahmed (Eds.) University of Hawaii Press (In press).
- Gjertsen, H., P. H. Dutton, and D. Squires. 2009. Conservation of the Leatherback Sea Turtle in the Pacific. In Handbook of Marine Fisheries Conservation and Management. Grafton, Q. and D. Squires (Eds.) Oxford University Press (In press).
- Gjertsen, H. and C. Hitipeuw. 2006. Using Socioeconomic Surveys to Design Community Incentives for Conservation. In Book of Abstracts from 26th Annual Symposium on Sea Turtle Biology and Conservation. Frick, M., A. Panagopoulou, A. F. Rees, and K. Williams (Eds.) International Sea Turtle Society, Athens, Greece, p. 346.
- Gjertsen, H. and T. Stevenson. 2009. Direct Incentive Approaches for Leatherback Turtle Conservation. In Conservation of Pacific Sea Turtles. Dutton, P. H., D. Squires, and M. Ahmed (Eds.) University of Hawaii Press (In press).
- Yeo, B., D. Squires, K. Ibrahim, H. Gjertsen, S. Kamil, R. Zulkifli, T. Groves, M. Hong, and C. Tan. 2009. Sea Turtle-Fisheries Interactions in Coastal Fisheries: A Case Study of the East Coast of Peninsular Malaysia. In Conservation of Pacific Sea Turtles. Dutton, P. H., D. Squires, and M. Ahmed (Eds.) University of Hawaii Press (In press).
- Yeo, B.H., D. Squires, K. Ibrahim, H. Gjertsen, S. K. Syed Mohd Kamil, R. Zulkifli, T. Groves, M. C. Hong, and C.H. Tan. 2009. Can Coastal Fisheries Bear the Cost of Sea Turtle Conservation - Evidence from the East Coast of Peninsular Malaysia. In Conservation of Pacific Sea Turtles. Dutton, P. H., D. Squires, and M. Ahmed (Eds.) University of Hawaii Press (In press).
- Yeo, B.H., D. Squires, K. Ibrahim, H. Gjertsen, S.K. Syed Mohd. Kamil, R. Zulkifli, T. Groves, M.C. Hong and C.H. Tan. 2007. Fisher profiles and perceptions of sea turtle-fishery interactions: case study of East Coast Peninsular Malaysia. The WorldFish Center Discussion Series 6, 69 p. The WorldFish Center, Penang, Malaysia.

Maldives

■ Bluepeace. 1996. Marine Turtle Conservation in the Maldives. Dhanfulhi. 8:6-8. *Not found on the Web.*

■ Frazier, J., Salas, S., Hassan Didi, N. T. 2000. Marine turtles in the Maldives Archipelago. Maldives Marine Research Bulletin 4: 80. http://thimaaveshi.files.wordpress.com/2009/09/volume4.pdf. *Island Chiefs and experienced fishermen were interviewed about turtles. In addition, Mr. N. T. Hassan Didi (NTHD) has spent nearly 60 years observing and enquiring about turtles in the Maldives.*

Mauritius

■ *November 2000: MMCS undertook a survey of all shops in Mauritius and Rodrigues selling stuffed turtles or turtle parts. Report unidentified. (Source: http://www.seaturtle.org/mtn/archives/mtn95/mtn95p21b.shtml)*

Mozambique

■ Costa, A., Motta, H., Pereira, M. A., Videira, E. J., Louro, C. M., & João, J. (2007). Marine Turtles in Mozambique: towards an effective conservation and management program. Marine Turtle Newsletter, 117, 1-3. http://www.seaturtle.org/mtn/archives/mtn117/mtn117p1.shtml. *This article describes the community-based Mozambique Marine Turtle Working Group (MMTWG) programme from 2004. Reports that subsistence fishers are starting to play a more active and positive role in turtle conservation. Education and awareness campaigns aimed at local communities and fishers*

specifically led by the MMTWG Project in Primeiras and Segundas Islands, and the ZSL, were successful in changing the attitudes of fishers towards turtles and turtle conservation.

■ DNAC. 2010. Maputo Special Reserve Management Plan, First Edition. vi + 119pp. http://www.opwall.com/Library/Opwall%20library%20pdfs/Reports/South%20Africa/Mozambique/Maputo%20Special%20Reserve%20Management%20Plan%20-%20First%20Edition.pdf

■ Garnier J, Hill N, Silva I, Wittt MJ, Godley BJ. 2012. Status and community-based conservation of marine turtles in the northern Querimbas Islands, Mozambique. Oryx 46:359-367. http://www.seaturtle.org/PDF/GarnierJ_2012_Oryx.pdf. *Describes community- based monitoring programmes coordinated by the Mozambique Marine Turtle Working Group, and the Zoological Society of London (CABO Delgado/Maluane Marine Turtle Programme).*

■ Garnier, J., Silva, I., Davidson, J., Hill, N., Muaves, L., Mucaves, S., Guissamulo, A. & Shaw, A. 2008. Co-Management of the Reef at Vamizi Island, Northern Mozambique. CORDIO Status Report. http://awsassets.wwfmz.panda.org/downloads/co_management_of_the_reef_at_vamizi_island.pdf. *Describes the 2001 Maluane initiative by ZSL.*

■ Garnier, J., Silva, I.. 2007. Cabo Delgado Biodiversity and Tourism Project. Marine turtle programme: Report of activities 2006 / 2007. Zoological Society of London / Maluane Mozambique. http://www.ioseaturtles.org/bibliography_search_detail.php?id=480.

■ Garnier, J., Dunham, K., Robertson, F. and Murphree, M. 1999. An ecological and sociological survey in the Cabo Delgado Province, northern Mozambique. Survey report and recommendations for the conservation of terrestrial and marine resources and for community involvement. CDBT/ZSL. Cabo Delgado Biodiversity and Tourism Project, Pmeba, Mozambique. 131 pp. *Not found on the Web.*

■ Impacto 1997. Mitos e lendas na gestao tradicional dos recursos naturais (Ilha da Inhaca). (Myths and traditional legends in the management of natural resources). 57 pp. Maputo, Impacto. *Not found on the Web. This study reports that, besides using the meat for human consumption, at Inhaca Island, the raw oil of the leatherback turtle is used to paint boats and when boiled is used for cooking.*

■ Magane, S & Joao, J. 2003. Local community involvement in monitoring and protection of sea turtles, loggerhead (*Caretta caretta*) and leatherback (*Dermochelys coriacea*) in Maputo Special Reserve, Mozambique. In J.A. Seminoff (Comp.). Proceedings of the 22nd Annual Symposium on Sea Turtle Biology & Conservation. NOAA Tech. Memo. NMFS-SEFSC-503, pp. 100-101. *Proceedings not found on the Web.*

■ Lombard, P. 2005. Monitoria e conservacao das tartarugas marinhas no sul de mocambique. Sumario relativo a onze anos (Monitoring and conservation of sea turtles in Southern mocambique. Summary relating to eleven years). 1995 - 2005. Ponta Malongane. 7 pp. *Unpublished. This description of community-based activities mentions reduced impacts (poaching, the killing of nesting females) along the south coast from Ponta Malongane to Ponto Dobela. The authors attributed this decline to more efficient beach monitoring as well as an increase in job creation in the tourism sector, in this region. Subsistence agriculture and new job opportunities to reduce the need for marine turtle's eggs and meat.*

■ Louro, C M M, E J S Videira, M A M Pereira, R Fernandes. 2012. Monitoring, tagging and conservation of marine turtles in Mozambique: annual report 2011/12. Maputo. CTV/AICM. http://www.ioseaturtles.org/UserFiles/File/RELATORIO_TM_1112_%20ENG.pdf

■ Pereira, M A M, E J S Videira, D A Narane & C M M Louro. 2010. Monitoring, tagging and conservation of marine turtles in Mozambique: 2009/10 annual report. 7 pp. Maputo, AICM/GTT. http://www.zonascosteiras.gov.mz/IMG/pdf/Moz_Turtle_Report_2009-10_EN_Final.pdf

■ Silva, G. S. 2007. Cabo Delgado Biodiversity and Tourism Project. Marine turtle programme: Report of activities 2006 / 2007. Zoological Society of London / Maluane Mozambique. http://www.ioseaturtles.org/bibliography_search_detail.php?id=480

■ Videira, E J S, M A M Pereira & C M M Louro. 2011. Monitoring, tagging and conservation of marine turtles in Mozambique: Annual report 2010/11. 10 pp. Maputo, AICM/GTT. http://www.iotc.org/files/proceedings/2011/wpeb/IOTC-2011-WPEB07-INF26.pdf

■ Videira, E.J.S., M.A.M. Pereira, C.M.M. Louro & D.A. Narane. 2008. Monitoring, tagging and conservation of marine turtles in Mozambique: historical data and annual report 2007/08. Mozambique Marine Turtle Working Group (GTT), Maputo. 85 pp. *Report not found on the Web.*

■ Williams, J. 2013. Moz Turtles: Searching for practical solutions to sea turtle poaching in Mozambique. African Diver Magazine, issue 26. http://www.africandiver.com/~adiver/index.php/component/phocadownload/category/2-african-diver-magazine-dnld?download=242:issue-26-moz-turtles.

■ *WCS: 2008: Socio-economic surveys were conducted for the community managed areas in Vamizi and adjacent Islands of Mozambique. (Source: http://www.swiofp.net/publications/coral-reefs/developing-an-implementation-strategy-to-prepare-for-the-management-of-coral-reefs-in-the-western-indian-ocean-for-climate-change).*

■ WWF. 2005b. Marine Turtle Conservation Activities in Mozambique. August 2004 to June 2005. Maputo. *Report not found on the Web. An assessment on the trade of marine turtle artifacts in Maputo City. Sale of marine turtle carapaces, in handcrafted form (necklaces, earrings, rings, bracelets, etc.) or whole turtles is common in shops (including the Maputo International Airport and other commercial centers) and markets of Maputo City.*

■ Xai-Xai, CDS-ZC/MICOA. Pereira, M. A. M., E. J. S. Videira & D. A. Narane. 2009. Monitoring, tagging and conservation of marine turtles in Mozambique: Annual report 2008/09. 4pp. Maputo, AICM/GTT. http://www.zonascosteiras.gov.mz/IMG/pdf/Relatorio_Moz_Turtle_2008-09_FINAL_En.pdf

Myanmar

■ Limpus, C. 2012. Assessment of turtle conservation actions at Thameehla Island. Report addressed to the Department of Fisheries, Myanmar. *Not available.*

■ Lwin, M. M. (2009). Green turtle (Chelonia mydas) Nesting and Conservation activity in Thameehla Island, Myanmar. Indian Ocean Turtle Newsletter No 10. http://www.iotn.org/pdf/IOTN10_2.pdf. *Describes the findings of a government-led project to breed and protect sea turtles on Thameehla Island (also known as Diamond Island) in Ngaputaw Township, Ayeyarwady Division.*

■ Lwin, M. M. 2008. Status of Marine Turtle Conservation and Management in Myanmar. Fifth Meeting of the Signatory State of Indian Ocean and South-East Asia Marine Turtle Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia, 20-23 August 2008, Bali, Indonesia. *Not found on the Web.*

■ Win, A.H., Lwin, M.M. 2012. Interaction between Fishing Activities and Marine Turtles in Myanmar. Conference paper. http://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/154050/1/11thseastar_5.pdf. *This paper mainly describes the mitigation regulations and awareness activities put in place by the Myanmar government to reduce fisheries interactions with marine turtles in Myanmar. It also reports that some villagers and fishermen inform that when the turtles are caught in their fishing net, they try to release them back into the sea. If turtles died they consume the meat of turtles and sell the carapace to the market.*

Oman

■ Baldwin, R. M. and Al-Kiyumi, 1999. The ecology and conservation status of the sea turtles of Oman. In Fisher, M., Ghazanfar, S. and Spalton, A. eds. The Natural History of Oman. A festchrift for Michael Gallagher. Backhuys Publishers, Leiden, The Netherlands. pp. 89-98. *Not found on the Web.*

■ Como, G. V. and Grobler, H. 1998. Survey results: 1997/98 - recreation demand at the Ras Al Hadd/Ras Al Jinz turtle reserve. Presented at a local workshop. Ministry of Regional Municipalities and Environment. Muscat, Oman. 9 pp + appendices. *Not found on the Web.*

Pakistan

■ Firdousa, F., 2001. Sea Turtle Conservation and Education in Karachi, Pakistan. ASEAN. In: Sea turtles of the Indo-Pacific (eds. N.J. Pitcher and G. Ismail) Rev. Biodiv. Environ. Conserv. (ARBEC) pp. 1–10. http://www.wildlifeofpakistan.com/ResearchPapers/art5julysept01.pdf

■ Hussain, B. 2010. Studies on population, status, distribution, and environmental impacts on reptiles in the vicinity of Karachi coast. PhD thesis. University of Karachi. Pakistan. (Unpublished Ph.D. Dissertation). *This PhD thesis made the use of traditional ecological knowledge.*

■ Khan, A. 2013. Pakistan wetlands programme's marine turtle conservation efforts on Daran Beach, Jiwani, Pakistan. Indian Ocean Turtle Newsletter No. 17, January 2013. http://www.iotn.org/pdf/iotn17_7.pdf

■ *Sindh Wildlife Department in collaboration with NGOs carried out some surveys of fishing practices in relation to turtle by-catch. But research on this issue is at preliminary stage. (Source: IOSEA NR).*

■ Waqas, U., Hasnain, S. A., Ahmad, E., Abbasi, M. and Pandrani, A. 2011. Conservation of Green Turtle (*Chelonia mydas*) at Daran Beach, Jiwani, Balochistan. Pakistan J. Zool., vol. 43(1), pp. 85-90.). http://zsp.com.pk/85-90%20%2814%29%20PJZ-167-09.pdf. *Studies were undertaken on the beaches of Daran (N 25°02.592, E 061°49.109), located 15 km south-east of Jiwani town. WWF-Pakistan initiated a marine turtle conservation project in this area in 1999. The project succeeded in developing interest towards turtle conservation, including collection of data, within the local community of Daran village.*

Papua New Guinea

■ Kinch, J. 2007. Community and Schools Education and Awareness Program for the Huon Coast Leatherback Turtle Conservation Program, Morobe Province, Papua New Guinea. Report prepared for the Western Pacific Regional Fisheries Management Council, Honolulu, Hawaii, USA. *Not found on the Web.*

■ Work, T. 2002. Pacific Leatherback Health Assessment Project – Final Report. Report prepared for the National Marine Fisheries Service, Honolulu, Hawaii, USA. *www.reefbase.org/pacific/pub_A0000005094.aspx. Not freely available. All eggs laid along sections of the Huon coast were observed to be taken soon after laying.*

Philippines

■ Bagarinao, T.U., Doyola-Solis, E.F., Fernando-Teves, J.E. 2010. The Pawikan album: The sea turtles captured around Panay and Guimaras Islands, Philippines. SEAFDEC FishWorld, SEAFDEC Aquaculture Department, Tigbauan, Iloilo, Philippines. *Not found on the Web. Record of 93 sea turtles captured from around SEAFDEC / AQD, with documentary photographs of 67 individuals. The report includes a detailed account of the interactions of sea turtle with fishing gears and people.*

■ Basintal, P**.** 2013. Management of the Turtle Islands Heritage Protected Area. Regional Meeting on Conservation and Management of Sea Turtle Foraging Habitats in Southeast Asian Water. 22-24 October 2013. Kuala Lumpur. http://www.ioseaturtles.org/UserFiles/File/elec_lib/Management%20of%20the%20Turtle%20Islands%20Heritage%20Protected%20Area%281%29.pdf

■ Worah, S. 2003 (a). 'Integrated Conservation and Development: Evolution, lessons learned and new directions', presentation made in WWF-Philippines. *Unavailable.*

■ Worah, S. 2003 (b). Participatory Review of the Turtle Islands Integrated Conservation and Development Project. Project review conducted by WWF-United Kingdom. *Unavailable.*

Saudi Arabia

■ Pilcher N. J., 1999. Cement dust as a cause of sea turtle hatchling mortality at Ras Baridi, Saudi Arabia. Mar. Poll. Bull. 38(11): 966-969. *Article not available on the Web. The effects of cement dust on hatchling survival are discussed.*

Seychelles

■ Allen et al. 2010. Hawksbill turtle monitoring in Cousin Island Special Reserve, Seychelles: an eight-fold increase in annual nesting numbers. Endang. Species Res. 11:2010.

■ *MCSS*:

- Hutchinson, A., Hutchinson, B.J. and Koenig, K. (2007) The Global Hawksbill Nesting Map. In Volume III: State of the World's Sea Turtles, 46 pages. Data source (Seychelles): record no. 97 – Talma, E.
- Integrated Approach to Turtle Management: Poster presentation by MCSS to Atmosphere, Ecology, Ocean Dynamics in the Western Indian Ocean, for the Royal Society, London, January 2004.
- Talma, E.S. (2005) 2004-05 Turtle Nesting Season. Marine Conservation Society Seychelles. Unpublished technical report, 25 pages.
- Talma, E.S. (2006) 2005-06 Turtle Nesting Season. Marine Conservation Society Seychelles. Unpublished technical report, 23 pages.
- Talma, E.S. (2006) Assessment of turtle nesting activity on Pezula "Annonyme" Island. Unpublished technical report, 8 pages.
- Talma, E.S. (2007) Report on Turtle Nesting Activity observed on Pezula "Anonyme" Island during the 2006-07 Nesting Season. Unpublished technical report, 15 pages.
- Talma, E.S. (2007) Report on Turtle Nesting Activity recorded by MCSS and Banyan Tree Resort in the South of Mahe during the 2006-07 Season. Unpublished technical report, 37 pages.
- Talma, E.S. (2007) Report on Turtle Nesting Activity observed by Constance Lemuria Resort on Praslin Island during the 2006-07 Nesting Season. Unpublished technical report, 16 pages.

■ Mortimer, J. A., Camille, J-C., Boniface, N. 2011. Seasonality and Status of Nesting Hawksbill (*Eretmochelys imbricata*) and Green Turtles (*Chelonia mydas*) at D'Arros Island, Amirantes Group, Seychelles. Chelonian Conservation and Biology 10(1):26-33. 2011. http://www.bioone.org/doi/abs/10.2744/CCB-0830.1?journalCode=ccab. *Not freely available.*

■ Mortimer, J.A. 2004. Seychelles Marine Ecosystem Management Project (SEYMEMP) - Turtle component: Final report - Appendices 1 to 11. 1-159 p.

■ Mortimer, J.A. 2000. Conservation of Hawksbill turtles (*Eretmochelys imbricata*) in the Republic of the Seychelles. 176-185 p. In: Pilcher, N.J., Ismail, G. (Eds.), Sea turtles of the Indo-Pacific: research, management and conservation. 176-185 p. ASEAN Academic Press Ltd., London. 176-185 p.

■ Mortimer, J.A. 2000. Sea turtle conservation programmes: Factors determining success or failure. 1-371 p. In: Salm, R.V., Clark, J.R., Siirila, E. (Eds.), Marine and Coastal Protected Areas: A guide for planners and managers. 1-371 p. IUCN, Washington D.C. 1-371 p. http://college.holycross.edu/faculty/kprestwi/chelonia/pubs/3_book_chapters/Mortimer_2000_IUCN.pdf

■ Mortimer, J. A. 1998. Sea turtles in the Republic of Seychelles: An emerging conservation success story. 18th International Sea Turtle Symposium. Proceedings of the Eighteenth International Sea Turtle Symposium. 24-27 p. http://aquaticcommons.org/2131/1/Fish_TM_436.pdf *This report describes the Hawksbill Artisan Compensation and Retraining Programme in 1993, whereby turtle artisans agreed to sell raw turtle shells to the Government and give up their turtle shell businesses in turn for compensation by the Government.*

■ *A study was conducted in 2001, involving communities residing adjacent to beaches in South Mahe whereby people were interviewed about their knowledge on the biology of marine turtles and their willingness to protect marine turtles. (Source: IOSEA NR, corresponding study not identified).*

South Africa

■ Poultney C, Spenceley A. 2001. Practical strategies for pro-poor tourism, Wilderness Safaris South Africa: Rocktail Bay and Ndumu Lodge. Pro-Tourism Working Paper No. 1, 1-43. http://www.researchgate.net/publication/228876014_Practical_Strategies_for_Pro-poor_Tourism_Wilderness_Safaris_South_Africa_Rocktail_Bay_and_Ndumu_Lodge. *This case study was written as a contribution to a project on 'pro-poor tourism strategies'. The pro-poor tourism project is collaborative research involving the Overseas Development Institute (ODI), the International Institute for the Environment and Development (IIED), the Centre for Responsible Tourism at the University of Greenwich (CRT), together with in-country case study collaborators. It is funded by the Economic and Social Research Unit (ESCOR) of the UK Department for International Development (DFID). The project reviewed the experience of pro-poor tourism strategies based on six commissioned case studies. The case studies used a common methodology developed within this project. The case study work was undertaken mainly between September and December 2000. Findings have been synthesised into a research report and a policy briefing, while the 6 case studies are all available as Working Papers.*

Sri Lanka

■ Ekanayake, E. M. L, Ranawana, K.B., Kapurusinghe, T., Premakumara, M.G.C., Saman, M.M. 2003. Community Participation For Work On Marine Turtle Research in Sri Lanka. Abs. Proceedings of the Peradeniya University Research Sessions Sri Lanka. Vol.8.161. *Unavailable. A description of the Turtle Conservation Project (TCP).*

■ Ekanayake, E. M. L, K.B.Ranawana T. Kapurusinghe M.G.C. Premakumara and M.M.Saman. 2002. Marine Turtle Conservation in Rekawa Turtle Rookery In Southern Sri Lanka. Ceylon Journal of Science (Biological Science) Vol.30 79-88. http://dl.nsf.ac.lk/bitstream/1/7598/2/CJS%28B.S%29-30-79.pdf. *Presents the results of research undertaken on nesting frequencies during the in situ nesting programme of TCP. Over approximately four years, grants to the project provided employment to villagers that resulted in protection of 827 nesting female marine turtles and to the resulting 3328 nests containing 372,107 eggs. Successful incubation resulted in 305,128 hatchlings being released to the sea.*

■ Kapurusinghe, T., Ekanayake, L., Rathnakumara, S., & Saman, M. M. 2012. Community-Based Ecosystem Conservation Approach (CBECA) – A new concept used for Sea Turtle Conservation in Sri Lanka. In Proceedings of International Forestry and Environment Symposium (Vol. 17). http://journals.sjp.ac.lk/index.php/fesympo/article/view/361. *An assessment of the effectiveness of the TCP. TCP has improved the socioeconomic conditions and well being of the community through 'Community Based Ecosystem Conservation Approach' (CBECA). There, TCP implemented various community based projects at the same time, through different CBOs.*

■ Kapurusinghe, T., L. Ekanayake, Saman, M. M. And Rathnakumara, Deshapriya Saman. 2008. Community-based marine turtle conservation in Kosgoda, Sri Lanka: nesting results from 2005 to 2007. Testudo 6(5): 40-47. http://www.britishcheloniagroup.org.uk/testudo/v6/v6n5kapurusinghe. *A*

presentation of nesting statistics with respect to the numbers and seasonality of green and olive ridley turtles nesting at Kosgoda between 2005 to 2007.

■ Kapurusinghe. T and Ekanayaka L. 2004. Ecosystem approach in community-based turtle conservation in Sri Lanka. Proceedings of the twenty fourth Annual Symposium on Sea Turtle Biology and Conservation Costa Rica. In Press. *Not available.*

■ Kapurusinghe, T. 2012. Turtle night watch nature tourism: Sharing benefits to sustain local community and sea turtles in Rekawa Sanctuary, Sri Lanka. In Sustainable hospitality and tourism as motors for development : case studies from developing regions of the world.- London [u.a.] : Routledge, ISBN 978-012-385-196-3. - 2012, p. 377-389. http://www.equatorinitiative.org/nomination_documents/2766279_TCP%20Report-Thushan-final.doc.

■ Kapurusinghe, T. 2006. Status and Conservation of Marine Turtles in Sri Lanka. In: Marine turtles of Indian sub-continent: status, threats and conservation. eds . K. Shanker & B. C. Choudhury, Universities Press, Hyderabah. *Book not freely available on the Web.*

■ Kapurusinghe, T. 2003. TCP, Sri Lanka initiates a new in-situ turtle nest protection programme. Kachhapa Newsletter 9: 8. http://www.iotn.org/pdf/kachhapa/kachhapa9.pdf. *A short description of the TCP.*

■ Kapurusinghe, T. 2002. Community participation in turtle conservation in Sri Lanka. A collection of TCP Research Papers Vol 1. L. Ekanayake, The Turtle conservation Project (TCP) Sri Lanka: 25-27. *A summary of community-based turtle conservation projects (TCP) activities in Sri Lanka. TCP interviewed old traditional turtle egg collectors.*

■ Rajakaruna, R. S., Ekanayake, E.M.L., Kapurusinghe, T, Ranawana, K.B. 2013. Sea turtle hatcheries in Sri Lanka: Their activities and potential contribution to sea turtle conservation. Indian Ocean Turtle Newsletter No. 17. http://www.iotn.org/iotn-17-2.php. *A questionnaire survey was used to assess the activities of the seven hatcheries currently in operation in Sri Lanka. All the hatcheries were operated by private owners, and the primary motive was profit from ecotourism.*

■ Richardson, P. 2002. An Update of the progress of the turtle conservation project (TCP). A collection of TCP Research Papers Vol 1. L. Ekanayake, The Turtle conservation Project (TCP) Sri Lanka: 17-20. *Not available.*

■ Richardson, P. 1996. The Marine Turtle Hatcheries of Sri Lanka. A TCP review and assessment of current hatchery practices and recommendations for their improvement. Turtle Conservation Project and Centre for Herpetology, Madras Crocodile Bank. 04/08/(1996). 1-18 p. *Not available. A survey of the status of Sri Lanka's commercial 'tourist attraction' marine turtle hatcheries, all of which are operating illegally.*

■ Richardson, P. 1994. The turtle conservation project (TCP) Sri Lanka: how much is a turtle worth? Testudo 4(1): 17-21. http://www.britishcheloniagroup.org.uk/testudo/v4/v4n1srilankaT. *Not available. This article describes the first activities of the TCP in Rekawa and presents its first results.*

Thailand

■ Aureggi, M. 2010. Thirteen years of sea turtle conservation in South Thailand: are we avoiding extinction?. In Proceedings of the 5th International Symposium on SEASTAR2000 and Asian Bio-logging Science (The 9th SEASTAR2000 workshop) (pp. 21-24). http://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/107342/1/9thSeastar_21.pdf. *A report of the Naucrates Sea Turtle Conservation Project (STCP / SCP).*

■ Aureggi, M. & Chantrapornsyl, S. (2003). Conservation Project: sea turtles at Phra Thong Island, South Thailand. Kachhapa Newsletter 9: 3–5. http://www.iotn.org/pdf/kachhapa/kachhapa9.pdf. *A description of the preliminary results of the Sea Turtle Project (STP) at PT Island that began in 1996 and has focused on three main aspects: scientific research and conservation, an educational programme for the local community and conservation awareness.*

■ Aureggi, M., Chantrapornsyl, S. & Young, L. 2003. Conservation Project at Phra Thong and Kho Khao Islands, South West Thailand. Tiger Paper 30(3): 11–13. *Not available.*

■ Aureggi, M., Gerosa, G. & Chantrapornsyl, S. 2000. Elimination of egg poaching activity at Phra Thong island, Thailand. First Italian Meeting on Sea Turtle Biology and Conservation. Policoro, Italy. *Not available. This report shows how the protection activities of the STP have contributed to the decrease of egg poaching: STP has protected all nests and safely released more than 2000 hatchlings into the sea. In parallel, conservation awareness activities have been conducted among tourists on the island.*

■ Okuyama, J.,Kanokwan, B., Panumard, B., Somachai, M., Mickmin, C., Nobuak, A. 2003. Development on Sea Turtle Ecotourism in Mannai Island. Proc. of the 3rd SEASTAR2000 Workshop. http://repository.kulib.kyoto-u.ac.jp/dspace/handle/2433/44162. *Sea Turtle Conservation Station in Mannai Island was established for the biological study and the conservation of sea turtles, and can be the facility for environmental education and suitable base of ecotourism in the future. The aim of the survey is to examine the possibility of the ecotourism development in Mannai Island. To understand the current situation of the tourism in the area, authors interviewed 39 tourists and 47 local people in the Mannai Island area.*

United Arab Emirates (UAE)

N. A.

United Kingdom – BIOT

N. A.

Tanzania (United Republic of)

■ Darwall, W.R.T. 1996. Marine biological and marine resource use surveys in the Songo Songo archipelago, Tanzania. The Society for Environmental Exploration and the University of Dar es Salaam. Reports 3 and 4. http://frontier-publications.co.uk/reports/Tanzania/Marine/Songo1994-1996/FTMRSongoSongo.pdf. *25 marine research assistant volunteers accompanied fishermen to the fishing sites (from 1 day to 10 days) and collected information on fish catch, time spent fishing, soaking time, fishing location, etc. Reports of incidental catches of turtles.*

■ Khatib, A. A. 1998. Sea turtles nest recording program: Unguja Island. AMBIO 27(8): 763-64. (Commission of Lands & Environment, P.O.B. 811, Zanzibar, Tanzania). *Unavailable. Nest recording programmes were initiated, using village-based observers, between 1997 – 1998 on Unguja, to determine the presence or absence of nesting turtles, verify the important nesting beaches and promote conservation education. These surveys were conducted jointly by the Department of the Environment and local communities.*

■ 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. *This report describes how rapid growth of tourism on Zanzibar in early 1990s created a new souvenir market for turtle shells and turtle products such as jewellery, and may have encouraged hunting of them. However, this trade has ceased following the collection and burning of 657 turtle products from curio shops in 1995. The status of turtles in Islamic religion appears to be a matter of personal interpretation and the meat and eggs are eaten by many Muslims, not only on Zanzibar, where they comprise 95% of the population, but also in other predominately Islamic locations (e.g Mafia).*

■ Mahenge. 2008. A successful co-management of marine turtle conservation in Mnazi Bay-Ruvuma Estuary Marine Park, Tanzania. 28th Sea Turtle Symposium, Loreto, Mexico, 19-26 January 2008. http://www.ioseaturtles.org/bibliography_search_detail.php?id=160. *This report shows how the long-*

term conservation strategy for marine turtles in Mnazi Bay–Ruvuma Estuary Marine Park, developed in October 2003, had a positive impact on turtle populations, and encouraged a feeling of ownership of natural resources by local communities.

■ Muir, C.E. 2007. Community-based endangered marine species conservation: Tanzania. http://www.assets.panda.org/downloads/africanmarineturtleupdate1.pdf. *This report describes the community-based endangered species and habitat protection programme, initiated in January 2001, that aims to promote the long-term survival of marine turtles and dugongs in the MIMP through proactive community participation, training, public awareness, research and monitoring.*

■ 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. http://www.crc.uri.edu/download/TZ_SOC_2001.pdf. *This report provides an overview of the status and trends in the condition and use of Tanzania's coastal resources and quality of life in coastal communities. It is based on best available scientific information and local knowledge that has the goal of helping government agencies, donors and practitioners involved in coastal planning and management to develop and promote sustainable coastal development strategies and programmes of action. The preparation of this report builds on workshops, consultations, literature review, and field surveys carried out by the Science and Technical Working Group.*

■ 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. *Unavailable. Nest recording programmes were initiated, using village-based observers, between 1995 – 1997 on Pemba, to determine the presence or absence of nesting turtles, verify the important nesting beaches and promote conservation education. These surveys were conducted jointly by the Department of the Environment and local communities. Turtle education campaigns have already proved highly valuable as conservation tools in Zanzibar, Mafia, Kilwa and Mtwara. In March 1996 two cases of poisoning through consumption of hawksbill turtle meat occurred, resulting in the death of 37 people.*

■ West, L. 2010. A multi-stakeholder approach to the challenges of turtle conservation in the United Republic of Tanzania. Indian Ocean Turtle Newsletter 11: 44-50. *This paper describes community based nest monitoring undertaken by SeaSense from 2001.*

■ *2003 (April - June): Sea Sense (under TTDCP program) conducted a national questionnaire survey (450 respondents) to determine the status, distribution, uses and threats to turtles in Tanzania. Report unavailable.*

United States - Commonwealth of the Northern Mariana Islands (CNMI)

N. A.

Viet Nam

■ Van der Meeren, S., Nguyen Huong Thuy Phan. 2009. Final Evaluation of the UNDP / GEF Project: Coastal and Marine Biodiversity Conservation and Sustainable Use in the Con Dao islands region. http://erc.undp.org/evaluationadmin/downloaddocument.html?docid=2784. *This report describes the UNDP / GEF project supported by Con Dao National Park (CDNP) to establish a marine protected area management framework. It also supported the Con Dao islands region to incorporate strategic environmental assessment (SEA) into district planning frameworks, and advocated for sustainable tourism development. The quantitative data provided in the May 2009 performance indicators report (Annex 2) is supported by qualitative data from fishermen consulted during this evaluation, using semi structured interview techniques to gauge what key stakeholders felt to be key project achievements and shortcomings and the main reasons for these.*

■ Van der Meeren, S., Nguyen Huong Thuy Phan. 2009. Final Evaluation of the UNDP / GEF Project: Coastal and Marine Biodiversity Conservation and Sustainable Use in the Con Dao islands

region. Annex 2: Analysis of quantitative data, Activities and Outputs from May 2009 Indicators Report. *Unavailable. WWF undertook an extensive process of consultation in early 2007 to identify livelihood issues and opportunities, using a mix of questionnaire based surveys, semi structured interviews and participatory rural appraisal (PRA) through group and individual consultations. Stakeholder groups consulted include the CCG, CDNP, district Government departments, Border Army, tourism enterprises and fishermen. The consultation process identified aquaculture and simple tourism services as offering the greatest potential for AIG. An assessment of the potential of aquaculture to provide AIG for small scale fishermen and divers was undertaken. This identified seaweed farming as the only viable AIG initiative for Con Dao.*

■ Government of Vietnam and WWF. 2009. "Improving the Knowledge Base and Identifying Management Options for the Reduction of Sea Turtle Interactions in Vietnamese Fisheries" (By-catch project"). Phase two. *Not found on the Web. This report describes the implementation of a first-of-its-kind Observer Program in the long-line fleet, in order to ground-truth data, determine baseline on catch rates for target fish and for by-catch, as well as socio-economic parameters (2008-2009).*

■ *Interview-based studies were carried out in 1998-2002 by Research Institute of Marine Fisheries (RIMF) and 2002-2003 by IUCN Vietnam, in Thanh Hoa (Tonkin Gulf), Quang Nam, Da Nang and Khanh Hoa provinces (Central of Vietnam). Reports not found on the Web.*

Yemen

Apel, M. & Hariri K.(eds). 2001. Conservation and Sustainable Use of the Biodiversity of Soqotra Archipelago. Marine Habitat, Biodiversity and Fisheries Management. Progress Report of Phase III. Senkenberg Research Institute, Frankfurt a.M. Germany. Report for SCDP/EPA, Sana'a, Yemen, 191pp. *Unpublished.*

All IOSEA countries

■ Talib, Z., Ali, A., Yaacob, K. Y. K., Isa, M. M. 2004. Conservation and enhancement of sea turtles in the Southeast Asian region. SEAFDEC. *Not available on the Web (paper version at IOSEA Secretariat). This report is the outcome of a project on Conservation and Management of Sea Turtles in Southeast Asian countries conducted from 1998 to 2003. The project was led by the SEAFDEC/MFRDMD in Terengganu, Malaysia and was financially supported by the Japanese Government under the ASEAN-SEAFDEC Fisheries Consultation Group Mechanism.*

■ IOTC–WPEB092013. Report of the Ninth Session of the IOTC Working Party on Ecosystems and Bycatch. La Réunion, France, 12–16 September, 2013. IOTC–2013–WPEB09–R[E]: 98 pp. http://www.iotc.org/files/proceedings/2013/wpeb/IOTC-2013-WPEB09-R%5BE%5D.pdf; *see http://www.ioseaturtles.org/feature_detail.php?id=402 for a description.*

WIOMSA countries: Kenya, Tanzania, Mozambique, South Africa, Madagascar, Comoros, Seychelles, Mauritius, La Reunion.

■ *WIOMSA project: The effectiveness of community-based organizations in managing coastal resources in the Western Indian Ocean.*

- Cinner, J. 2010. 'Middle class' reef fish feel the economic squeeze. People & the Environment 4: 28. *Not found on the Web.*
- Cinner, J. 2010. Poverty and the use of destructive fishing gear near east African marine protected areas. Environmental Conservation. (4): 321-326. *Not found on the Web.*
- Cinner, J and Ö. Bodin. 2010. Livelihood diversification in tropical coastal communities: a network-based approach to analyzing 'livelihood landscapes' PLoS ONE http://dx.plos.org/10.1371/journal.pone.0011999
- Pollnac, R., P. Christie, J. Cinner, T. Dalton, T. Daw, G. Forrester, N. Graham, T. McClanahan 2010. Marine reserves as linked social-ecological systems. Invited article in

Proceedings of the National Academy of Sciences (PNAS). 107: 18262-18265. *Not found on the Web.*

- Lokrantz, J., M. Nystrom, A. Norstrom, C. Folke, J. Cinner. 2010. Impacts of artisanal fishing on key functional groups and the potential vulnerability of coral reefs. Environmental Conservation. 36: 327-337. *Not found on the Web.*
- Joshua E. Cinner, Andrew Wamukota, Herilala Randriamahazo, Ando Rabearisoa. 2009. Toward institutions for community-based management of inshore marine resources in the Western Indian Ocean. Marine Policy. 33 (3):489-496
- Cinner, J. T. McClanahan, T. Daw, N.A.J. Graham, J. Maina, S.K. Wilson, T.P. Hughes. 2009. Linking social and ecological systems to sustain coral reef fisheries. Current Biology: 19: 206-212. *Not found on the Web.*
- Cinner, J, T.M. Daw, T.R. McClanahan 2009. Socioeconomic factors that affect artisanal fishers' readiness to exit a declining fishery. Conservation Biology: 23: 124-130. *Not found on the Web.*
- Hicks, C. C., T. R. McClanahan, J. E. Cinner, and J. M. Hills. 2009. Trade-offs in values assigned to ecological goods and services associated with different coral reef management strategies. Ecology and Society 14:10. http://www.ecologyandsociety.org/vol14/iss11/art10/.

■ WIOMSA ongoing project, with C3 (E. Wood): The marine ornamental and curio trades in the Western Indian Ocean – benefit or threat?
http://www.wiomsa.org/index.php?option=com_content&view=article&id=284&Itemid=314

■ WIOMSA. Global markets and the livelihoods of coastal communities in the WIO: Implications for sustainable coastal management. August 2008- August 2010 Study project (Funding by MASMA). http://www.wiomsa.org/index.php?option=com_content&view=article&id=292&Itemid=306. *Report unavailable. The methods of data collection include, livelihood trajectories, in-depth Interview, Community Based Participatory Research Appraisal and Social Survey. The major outputs of this study include papers for presentation in various workshops/conferences including those organized by WIOMSA. The research team expects to publish the final results into a book or articles in internationally recognized journals. However, it is unclear whether this study includes marine turtles in its scope.*

Worldwide papers

■ Cambell, L. 2002. Sustainable use of marine turtles: Views of conservation experts. Ecological Applications. 12 (4): 1229-1246. *Not found on the Web.*

■ Frazier, J.G., R. Arauz, J. Chevalier, A. Formia, J. Fretey, M.H. Godfrey, R. Marquez-M., B. Pandav & K. Shanker. 2007. Exploitation of Lepidochelys at sea. In: Biology and Conservation of ridley turtles (eds. P. Plotkin and S. Morreale). Johns Hopkins Press, USA. http://bit.ly/cuEOL3.

■ Hope, R. 2002. Wildlife Harvesting, conservation and Poverty: the economics of olive Ridley egg exploitation. Environmental Conservation. 29 (3): 375-384. *Not found on the Web.*

■ Lam, T., Xu Ling, Takahashi, S., Burgess, E.A. 2011. Market Forces: An Examination of Marine Turtle Trade in China and Japan. TRAFFIC East Asia, Hong Kong. http://www.traffic.org/species-reports/traffic_species_reptiles34.pdf. *This report analyses 128 seizures involving the East Asian countries between 2000 and 2008, with a trade volume of over 9180 marine turtle products including whole specimens (2062 turtles), crafted products (n = 6161 pieces) and raw shell (789 scutes and 919 kg).*

■ Lewison R, Crowder LB, Wallace BP, Moore JE, Cox T, Zydelis R, McDonald S, DiMatteo A, Dunni DC, Kot CY, Bjorkland R, Kelez S, Soykan C, Stewart KR, Sims M, Boustany A, Read AJ, Halpin P, Nichols WJ, Safina C. 2014. Global patterns of marine mammal, seabird, and sea turtle bycatch reveal taxa-specific and cumulative megafauna hotspots. Proceedings of the National Academy of Sciences 111 (14): 5271 – 5276.
http://www.pnas.org/content/early/2014/03/13/1318960111. *Loss of megafauna, termed trophic downgrading, has been found to affect biotic interactions, disturbance regimes, species invasions, and*

nutrient cycling. One recognized cause in air-breathing marine megafauna is incidental capture or bycatch by fisheries. Characterizing megafauna bycatch patterns across large ocean regions is limited by data availability but essential to direct conservation and management resources. We use empirical data to identify the global distribution and magnitude of seabird, marine mammal, and sea turtle bycatch in three widely used fishing gears. We identify taxa-specific hotspots and find evidence of cumulative impacts. This analysis provides an unprecedented global assessment of the distribution and magnitude of air-breathing megafauna bycatch, highlighting its cumulative nature and the urgent need to build on existing mitigation successes.

■ Mrosovsky, N. 2000. Sustainable Use of Hawksbill Turtles: Contemporary Issues in Conservation. Darwin: Northern Territory University. *Not found on the Web.*

■ Shanker, K. 2004. Marine turtle status and conservation in the Indian Ocean. Papers Presented at the Expert Consultation on Interactions between Sea Turtles and Fisheries within an Ecosystem Context, Rome, 9-12 March 2004. FAO Fisheries Report No. 738, Supplement, p. 85-134. Appendix 2: Fisheries and sea turtle mortality in South Asia.
ftp://ftp.fao.org/docrep/fao/007/y5750e/Y5750E02.pdf

■ Troëng S, Drews C. 2004. Money talks: Economic aspects of marine turtle use and conservation. http://www.wwf.de/fileadmin/fm-wwf/Publikationen-PDF/Meeresschildkroeten_Money_Talks_Studie_04.pdf

■ Wallace, B. P., DiMatteo, A. D., Bolten, A. B., Chaloupka, M. Y., Hutchinson, B. J., Abreu-Grobois, F. A., ... & Mast, R. B. 2011. Global Conservation Priorities for Marine Turtles. MTSG - IUCN. PlosOne 6:9.
http://www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0024510&representation=PDF. *A collaboration of over 30 experts from 6 continents and more than 20 countries to make the first comprehensive status assessment of all sea turtle populations globally. The impact of fisheries bycatch, human consumption of turtles and their eggs, coastal development, pollution and pathogens, and climate change was assessed for each RMU.*

■ Wallace, B. P., Connie Y. Kot, Andrew D. DiMatteo, Tina Lee, Larry B. Crowder, and Rebecca L. Lewison 2013. Impacts of fisheries bycatch on marine turtle populations worldwide: toward conservation and research priorities. Ecosphere 4:art40. http://dx.doi.org/10.1890/ES12-00388.1. *Authors provide the first global, multi-gear evaluation of population-level fisheries bycatch impacts for marine turtles. To compare bycatch impacts of multiple gears within and among marine turtle populations (or regional management units, RMUs), we compiled more than 1,800 records from over 230 sources of reported marine turtle bycatch in longline, net, and trawl fisheries worldwide that were published between 1990–2011. The highest bycatch rates and levels of observed effort for each gear category occurred in the East Pacific, Northwest and Southwest Atlantic, and Mediterranean regions, which were also the regions of highest data availability. Overall, available data were dominated by longline records (nearly 60% of all records), and were non-uniformly distributed, with significant data gaps around Africa, in the Indian Ocean, and Southeast Asia. We found that bycatch impact scores—which integrate information on bycatch rates, fishing effort, mortality rates, and body sizes (i.e., proxies for reproductive values) of turtles taken as bycatch—as well as mortality rates in particular, were significantly lower in longline fishing gear than in net and trawl fishing gears. Based on bycatch impact scores and RMU-specific population metrics, we identified the RMUs most and least threatened by bycatch globally, and found wide variation among species, regions, and gears within these classifications. The lack of regional or species-specific patterns in bycatch impacts across fishing gears suggests that gear types and RMUs in which bycatch has the highest impact depend on spatially-explicit overlaps of fisheries (e.g., gear characteristics, fishing practices, target species), marine turtle populations (e.g., conservation status, aggregation areas), and underlying habitat features (e.g., oceanographic conditions). Our study provides a blueprint both for prioritizing limited conservation resources toward managing fishing gears and practices with the highest population impacts on sea turtles and for enhancing data collection and reporting efforts.*

■ Wallace, B.P., Lewison, R.L., McDonald, S.L., McDonald, R.K., Kot, C.Y., Kelez, S., Bjorkland, R.K., Finkbeiner, E.M., Helmbrecht, S.r. and Crowder, L.B. 2010. Global patterns of marine turtle

bycatch. Conservation Letters, 3:131-142. http://onlinelibrary.wiley.com/doi/10.1111/j.1755-263X.2010.00105.x/abstract. *Authors compiled a comprehensive database of reported data on marine turtle bycatch in gillnet, longline, and trawl fisheries worldwide from 1990 to 2008.*

■ Wang J, Barkan J, Fisler S, Godinez-Reyes C, Swimmer Y. 2013. Developing ultraviolet illumination of gillnets as a method to reduce sea turtle bycatch. Biol Lett 9:20130383. http://rsbl.royalsocietypublishing.org/content/9/5/20130383.short?rss=1. *Authors examined the effectiveness of illuminating gillnets with ultraviolet (UV) light-emitting diodes for reducing green sea turtle (Chelonia mydas) interactions in a bottom-set gillnet fishery in Baja California, Mexico. Authors did not find any difference in overall target fish catch rate or market value between net types. These findings suggest that UV net illumination may have applications in coastal and pelagic gillnet fisheries to reduce sea turtle bycatch.*

■ WWF. 2013. 2011 Runner-Up: Turtle lights for gillnets. http://www.iotc.org/files/proceedings/2013/wpeb/IOTC-2103-WPEB09-INF07%20-%20Gillnet%20lights.pdf