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Present status of conservation and management of sea turtle in Cox's Bazar district, Bangladesh

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Abstract - The study was conducted to know the present status of conservation and management of sea turtle in Cox's Bazar district, Bangladesh. Two species of sea turtles have been making nest in Bangladesh. A total of 251 turtle individuals were found. The highest nesting frequency of Olive ridley (108) and Green turtles (10) were observed in February. About 21,942 hatchlings were produced and released by the hatcheries for conservational step. A total of one hundred people were selected randomly for taking interview to assess their knowledge and attitude towards sea turtle conservation and management. Most of the respondents were fishermen (55%), student and housewife were 20% and 8%, 5% were found involving in business and rest 12% were involved in others activities. About 45% of the respondents thought that turtles were beneficial while other 40% of the respondents thought turtles were harmful. The rest of the respondents (15%) answered that they were not sure whether sea turtle was beneficial or harmful. Most of the fishermen did not know about Turtle Excluder Devices (TEDs) or its uses. It was found that the nesting of sea turtles was reducing and there was lack of knowledge among the people of the study area about the importance of sea turtle conservation and management.

Key words: Sea turtle, Olive ridley, TEDs, Conservation and management.

Introduction

Bangladesh (20°34'–26°38' N and 88°01'–92°41' E) located on the northern side of the Bay of Bengal in mainland of Asia. It is one of the resourceful countries with its wide range of marine and aquatic biodiversity. There are about 1093 marine aquatic species where 44.35% are finfish, 32.23% shellfish, 15.10% seaweeds and only 8.32% are other organisms including shrimps and sea turtles (Kabir, 2006). Seven species of sea turtle live in the world's oceans. Five species of sea turtles are found in the territorial water of Bangladesh, namely olive ridley turtle (*Lepidochelys olivacea*), green turtle (*Chelonia mydas*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*) and leatherback turtle

(*Dermochelys imbricata*) (Smith, 1931; Husain, 1976; Shafi and Quddus, 1977; Khan, 1982 and 1987; Sarker and Hossain, 1995; Das, 1989 and Rashid, 1997). Sea turtles have never been prioritized in any agenda for research or conservation since Bangladesh gained independence in 1971. The only available information was in a few anecdotal notes, district gazetteers, forest department reports and newspaper reports in national dailies on the captures of sea turtles by fishermen. There were no scientific publications or systematic surveys on sea turtles until recently. Some information from sporadic surveys and observations first started to appear in the 1980s (Khan, 1982 and 1987; Rashid, 1984 and 1986) and provided the impetus to conduct surveys and update available information on the status of sea turtles in Bangladesh. Rashid (1997) attempted to collect information from published literature.

Sea turtles occupy a special niche in the marine ecosystem and have survived millions of years in this environment. Sea turtles are important for economic and ecological reasons. Firstly, the shrimp industry has a great stake in the conservation of sea turtles as the government has to certify that no sea turtles were killed during the trawls of the deep-sea fishing trawls. Secondly, the sea turtles control the populations of the jelly fish which devour huge amount of fishes, and thirdly the turtles keep the aquatic environment clean by scavenging on the dead and rotten organic materials (Rashid, 1997). With the growing human activities in harvesting the marine resources particularly fishes, a lot of the sea turtles get entangled in the fishing nets, drown and die of suffocation. Besides through development and alteration of the coastal habitat the nesting habitats of the sea turtles have been directly affected and their populations have become vulnerable throughout the world. These pose an immense threat to the survival of these turtles since the adult populations are not being replenished by the recruitment of new individuals (Rashid, 2011). Turtles are consumed by a group of people as a source of protein and for its delicacy (Rao, 1987). Countless turtle species will be lost over the next few decades (Beebe, 2001). Although Bangladesh is a signatory of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the turtles and tortoises are still indiscriminately being killed. Unsustainable exploitation of turtle is a great threat of extinction in near future (Sarker and Hossain, 1995).

This study was conducted to assess the following objectives: To know the present status of conservation and management of sea turtle in Cox's Bazar district. To understand the levels of knowledge and awareness amongst local communities about turtles; and to identify present management shortfall and threats for sea turtle conservation and management in Cox's Bazar district.

Materials and Methods

The study was carried out under Cox's Bazar District, Bangladesh (Fig. 1). This area was selected because nesting frequency of sea turtle was very high there (Rashid and Islam, 1999) and dead sea turtles have been found there repeatedly year after. The study was conducted from December 2010 to November 2011.

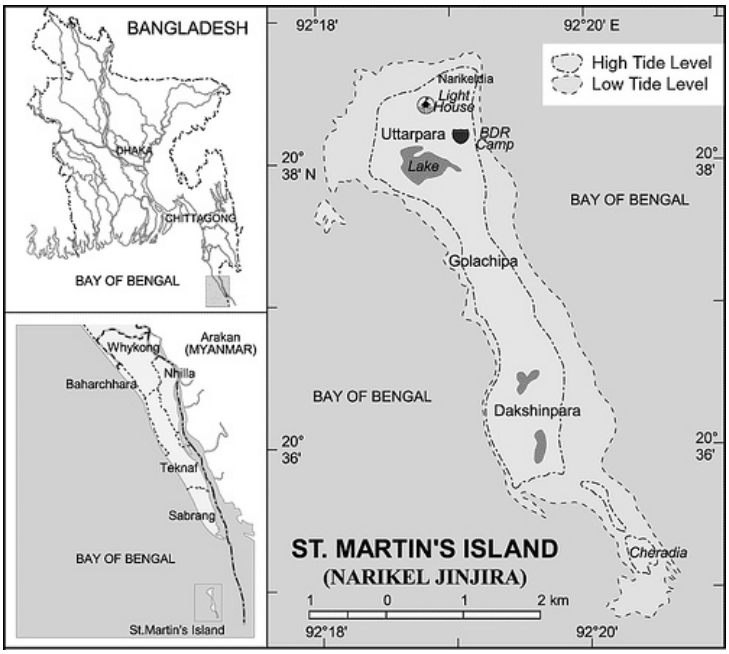

Figure 1. Map of Cox's Bazar district and St. Martin's Island, (limana, 2008).

The essential data were collected from secondary data source which were collected from different national and international NGOs and responsible Government department. One hundred randomly selected people of the study area were interviewed to assess the knowledge and attitude of people towards sea turtle conservation and management.

A verbal consent was sought from the participants after explaining the objectives of the study. Structured interviews were conducted with each person in the island using a questionnaire and Focus Group Discussion (FGD) with local communities. Information about the respondents (age, sex, educational background and occupation) was collected during the interview. Questions were asked to the respondents to assess his/her knowledge about sea turtles, attitude towards sea turtle conservation and the consumptive use of turtle eggs, meat and other products. An interview lasted 20-40 minutes. The information was accumulated, grouped and interpreted according to the objective as well as parameters. Some data contained numeric and some contained narrative facts. The collected data were then edited, summarized and graphically analyzed with MS excel.

Results

Present status, distribution and nesting of sea turtles in Cox's Bazar district:

Olive ridleys had been found to nest on sandy beaches all along the mainland coast of Cox's Bazar District and adjoining islands on the south-central coast; Inani, Kochopia, Bordal, Monkhali and southern Teknaf along

the southeastern mainland coast of Teknaf peninsula and Sonadia Island, Kutubdia Island, Moheskhali Island and St. Martin's Island on the southeast coast. Olive ridley turtles had been recorded nesting in the central islands and mainland beaches.

Green turtles had been found to nest on the mainland coasts and on island beaches. But they were found less widespread than olive ridleys. It was also reported they were found nesting south-central island beaches, mainland beaches in the southeast (from Cox's Bazar to Teknaf) and also on some coastal islands like St. Martin's, Sonadia, Kutubdia, Hatiya and Sand weep islands.

From the secondary data, it was found that Hawksbill turtle was a rare visitor to the beaches of Bangladesh. Based on unconfirmed reports, Hawksbill turtle was expected to be found but there was no sign of nesting Hawksbill turtle in this study area during this study period. There were some beaches where nesting of sea turtles was not common for either natural formation of beaches or due to coastal development. It was observed in the study area that nesting of olive ridley was higher than green turtle at St. Martin's Island in Cox's Bazar district. A total of 251 turtles were recorded to nest in that area. The highest nesting frequency of olive ridley (108) and green turtles (10) were observed in February (Fig. 2). There was no olive ridley found in May, June, July, August and September. No green turtles were found in April, May, June and August. The nesting of Hawksbill turtles or other sea turtles were not found at the period of the study.

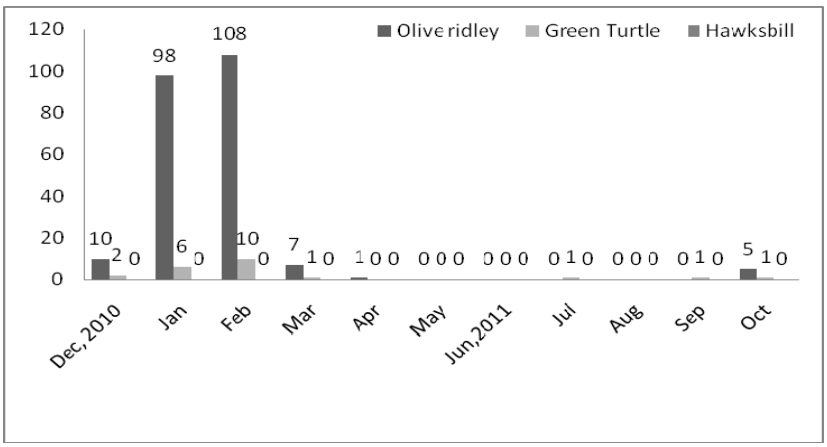

Figure 2. Nesting frequencies of sea turtles.

Seven hatcheries had been found in five areas of the Cox's Bazar coast. The areas were:

1. Sonadia East village Beach, Moheshkhali, Cox's Bazar by CWBMP, MLA
2. Sonadia West village Beach, Moheshkhali, Cox's Bazar by CWBMP, MLA
3. Pechardwip Beach, Teknaf Peninsular Beach, Cox's Bazar by CWBMP, MLA

4. Samchari Beach, Teknaf Peninsular Beach, Cox's Bazar by CWBMP, MLA
5. Shahporirdwip, Teknaf Peninsular Beach, Cox's Bazar by CWBMP, MLA
6. St. Martin's Island Beach, Cox's Bazar by CNRS
7. St. Martin's Island Beach, Cox's Bazar by SMP, CWBMP

Sea turtle hatcheries had been installed by Govt. and different NGOs at the sites mentioned above. All hatcheries had been found on beaches closest to the nesting grounds. Different NGOs were working for both *in situ* and *ex situ* conservation through hatching of turtle eggs. The *in situ* conservation was practiced in a small scale in the study area through fencing of nest and data were not properly recorded by the NGOs or the Govt. It was found that for the conservation purpose mainly *ex situ* conservation was performed in the study area through eggs collection and hatching in the hatcheries. The total amounts of 23,850 eggs were incubated in the study period and 21,942 hatchlings were produced and released.

Existing activities of Government and NGOs for sea turtle conservation and management in Cox's Bazar district:

At the period of the study, different initiatives for conservation and management activities of sea turtles were identified. The government of Bangladesh and national and international NGOs had taken many steps for fulfilling their goals to protect sea turtle population and their environment. Some initiatives were identified which were performing by Govt. and NGOs are presented in Table 1.

Table 1. Some activities for sea turtle conservation and management.

Organization	Major Activities
Government of Bangladesh	1. Declaration of Ecologically Critical Areas 2. Sustainable resource management 3. Establishment of ecotourism in that area
Non Government Organizations (NGOs) and International Organization	1. School education program 2. Community awareness program 3. Hatchery management 4. Establishment of education and research center 5. Establishment of hatcheries 6. Supporting ecotourism activity 7. Ex-situ conservation through hatcheries 8. Encouraging fisherman to use TEDs in gear

Knowledge and attitude of the people of Cox's Bazar district towards sea turtle conservation and management:

One hundred people from the study area were selected randomly for taking interview. Wide ranges of indicators were collected in various aspects of knowledge and attitude of the people on sea turtle. A detail analysis were made on the following parameters and presented in this section.

The age distribution of the respondents was measured for calculating the specific range of knowledge by different age group. It was found that most of the respondents were in-betweens ages of 31-40 years (Table 2). Fewer respondents were below 10 years. The young generation (age groups 11-20 and 21-30) were more aware of sea turtle conservation and management than the other groups.

Table 2. Different age groups of the people of the study area.

Age group	Frequency
Below 10	4
11-20	21
21-30	25
31-40	29
41-50	13
Above 51	8
Total	100

Most of the respondents were found male (84%), while female only (16%). Half of the female respondents were students and the rest of them were house wife. Most of the male respondents participated different conservational activities by the NGOs and Government and they knew more about turtles. It was found that the female respondents were less aware of sea turtle management and conservation than the male respondents.

Religion played a very important role in the socio-cultural status of people and acted as a notable constraint for social changes. In the study area, the majority of the respondent people were found Muslim (96%), and the rest (4%) were Hindu. No Buddhist and Christian were found during the survey. Conservational attitude varied with religion. Some Muslims were found interested for sea turtle conservation and management. Rest of them were found completely indifferent about the turtle's conservation whereas the followers of Hindu religion were not concerned about conservation and management of turtle rather they were found more interested in consuming turtle's eggs and meats. It was found that some people of the study area were engaged with turtle business. Most of the people said that Maghs, Hindus ate turtle eggs. They said that Hindus in their area mainly ate the turtle and its eggs. They also told that some local people of their area collected turtle's eggs and sold to the consumers. Some of turtle business activities were identified and those are presented in Table 3.

Table 3. Turtle business activities in Cox's Bazar District.

Turtle/eggs or shell	Consumers/Buyers
Eggs	*Maghs, Hindus,* Tourist
Meat of Turtle	Mainly *Hindus* but sometimes tourist
Turtle shell	Mainly tourist
Dried turtle	Local people, People from outside the area.

Most of the respondents were fishermen (55%), student and housewife were 20% and 8%, 5% were found involving in business and rest 12% were involved in others activities. Among them, others group was more concerned about sea turtle conservation and management. Student group was more or less concerned while two largest groups in terms of respondents were found nearly unconcerned about turtle management and conservation. The level of formal education of the respondents was about 48%, 30% respondents were found can sign but illiterate and 22% were no education (Could not sign). Formal education group was constituted by elementary, secondary and higher education group. Respondents under secondary and higher level of education thought sea turtle conservation and management should necessary in their area but most of them did not take part in conservational activities. No education and only sign group were found unconcerned about turtle conservation and management.

Respondents experience about sea turtles:

Most of the respondents answered that they didn't know much about the sea turtle although everyone of the respondents saw turtles in their area. Majority of the fishermen claimed that turtles reduced the fish population; some of them told that they heard to eat jelly fish and waste materials by turtles but they didn't believe that. Most of the students had idea that sea turtle ate jelly fish and waste materials. Majority of local people had no clear idea about sea turtles and its importance. They answered that turtles are good creature of Allah and turtles added beauty of their area. It was found that the majority of the respondents (89%) could differentiate turtle's eggs from other eggs (hens or ducks). Rest (11%) couldn't identify turtle's eggs. Most of the people answered that turtles were found in the tourist (winter) season (64%) while a large number of people (24%) didn't know much about it. Some of the respondent (6%) answered that turtles could be found in rainy season and few other (6%) seasons like late rainy or all round year. Nearly half of the respondent (47%) answered that they saw two types of turtles, while 41% saw single type and only 12% of them answered three or more types of turtles. Interesting answers came when they were asked to specify the name of turtle. They described big or small, leaf colour or spotted etc.

Conservation related knowledge of the respondent:

About 45% of the respondent thought that turtles were beneficial. Most of them replied that turtle ate waste, insect of the sea and kept clean the environment. About 40% of the respondent answered turtles were harmful because they ate fish and cut nets and created hazards. This group was constituted mostly by fishermen. The rest of the respondents (15%) answered that they were not sure whether sea turtle was beneficial or harmful. About 62% of the respondents considered that turtle as a bad sign for them and 38% of the respondents didn't think so. Those answered 'turtles as a bad sign' indicated that if they saw turtle during going to fishing total amount of catch was significantly reduced. To get rid of these problem then he had to arrange religious function (Muslim arrange 'MILAD'). About 78% of the respondent told that the abundance of sea turtle declined or

reduced comparing to the past while 18% of the respondent said the abundance was unchanged. Only 4% told that turtles increased comparing to the past.

About 49% of the respondents answered that they did not take part any seminar or rally.

About 14% of the respondent attended in a rally and 22% participated in a seminar while 15% attended both rally and seminar.

Conservation related knowledge of Fishermen:

About 60% of the fishermen answered that turtles were caught in their fishing net while the rest of them (40%) answered that they did not found turtles in their net during fishing.

Most of the fishermen answered that they found dead turtles in their net during fishing. Some fishermen said that they cut the net and released the turtles while only few of them said that they cut the flipper of the turtles to save their nets. Incidental capture was found one of the major threats to marine turtles in the marine environment. Sometimes fisherman used turtle excluder device (TED) devices with shrimp trawl net to avoid incidental capture of turtle which could reduce turtle mortality rate.

Most of the respondent of the study area answered that they did not know anything about TED. In the study area, several threats were identified through direct observation and from the answer of the respondents. Majority of the respondents said that turtles were declining day by day. Most of the respondents claimed that fishermen killed the turtles during fishing to save their valuable nets. The threats are listed in Table (4).

Table 4. Threats to sea turtle in Cox's Bazar District (Rashid and Islam, 2006).

Area	Threats
In the sea	1. Fisherman killed turtles if it entangled in net. 2. Collision with fishing vessels were also common and sometimes intentional. 3. Populations of other species eat the turtles. 4. Pollution (oil spills and other pollution) and disposal of solid domestic and machinery waste.
On nesting beaches	1. Nesting females were occasionally killed by stray dogs and jackals on coastal islands. 2. Traditional utilization by local coastal communities. 3. Physical alterations and development of infrastructure along the coast. 4. Utilization of beaches for drying fish and mending fishing nets. 5. Beach lighting had also increased which disturbs nesting females and is disorients hatchlings.
Climate change	1. Habitat loss. 2. Species loss etc.

International agreements affecting marine turtles in Bangladesh:
The Government of Bangladesh signed several international or regional agreements, conventions, treaties and protocols related to marine environment and biological resources which directly or indirectly affect marine turtles (Table 5). It was found that there was little protection of nesting or foraging habitats, which were critical to marine turtle survival. Beaches were already under intense pressure for development by the tourism industry. Some NGOs and Government projects were working on conservation in some areas, but it was not enough and the government had competing sectors such as tourism and infrastructure development that threaten nesting turtle populations.

Table 5. Lists of the international agreements, conventions, treaties and protocols signed, accessed, ratified by the Government of Bangladesh, which directly or indirectly affects marine turtles.

Conventions/Treaties/Protocols	Year ratified (r), signed(s) or accessed (a)
Convention on the Control of Trans boundary Movements of Hazardous Wastes and their Disposal, Basel, 1989.	1993 (a)
Agreement on the Network of Aquaculture Centres in Asia and the Pacific, Bangkok, 1988.	1990 (r)
Convention on the Continental Shelf, Geneva, 1958.	1990 (r)
Convention on Wetlands of International Importance especially as Waterfowl Habitat, RAMSAR, 1971.	1992 (r)
Convention Concerning the Protection of World Cultural and Natural Heritage, Paris, 1972.	1983 (r)
Convention on International Trade in Endangered Species of Flora and Fauna, Washington, 1973.	1982 (r)
Convention on Biological Diversity, Rio de Janeiro, 1992	1994 (r)
Convention on the Conservation of Migratory Species of Wild Animals, 1979.	2000 (s)
International Convention for the Prevention of Pollution of the Sea by Oil, 1954.	1981 (r)
International Convention on Oil Pollution Preparedness, Response and Cooperation, London, 1990.	1990 (s)
International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, Brussels, 1969.	1982 (r)
United Nations Convention on the Law of the Marine Environment, Montego Bay, 1982	1982 (r)
United Nations Framework Convention on Climate Change, New York, 1992.	1994 (r)
Indian Ocean – South-East Asian Marine Turtle MoU	2004 (s)

Discussion

Islam *et al.* (1999) reported that there were five species found in the territory of Bangladesh. Ahmed *et al*. (1986), Khan (1987), Rashid (1984, 1986), Rashid and Islam (1999) reported that three species of marine turtles nested in Bangladesh. Among them, olive ridleys and green turtles were common while Rashid (1997) and Islam (2002) reported that hawksbills were rare. Rashid and Islam (1999) mentioned that CARINAM initiated a study and conservation program on marine turtles (including the establishment of a hatchery) on St. Martin's Island in the Bay of Bengal. During their 18-month study period, 17,852 eggs were collected from 132 olive ridley and four green turtle nests, and 15,120 hatchlings were released in the Bay of Bengal. Tomascik (1997) reported in his study that National Conservation Strategy Implementation Project-1 (NCSIP-1) under the Ministry of Environment and Forests (MOEF) conducted a study on St. Martin's Island to develop a management plan for the island. Rashid and Islam (2006) found that the Government of Bangladesh (GOB) financed a MOEF project titled Conservation of Biodiversity, Marine Park Establishment and Ecotourism Development at St. Martin's Island (SMBMED) for the period 2000–05. One of the priorities of this project was to protect and manage important nesting beaches. Islam *et al.* (2011) stated that Marine Life Alliance conducted field activities along the coast of St. Martin island, Cox's Bazar - Teknaf coast and Sonadia Island. The majorities of their activities were monitoring of nesting and dead Sea turtles, *in situ* and *ex situ* breeding program throughout the 140 kms of coastline, habitat mapping and scientific morphometric data collection with the help of community awareness among the community people, local children's education through school program, by catch awareness program with the offshore fishermen through training and motivation. Some of their other efforts were also satellite tracking, tagging, off shore survey etc. Sea turtle tagging and tracking process by various NGOS were also identified at the time of study. Rashid and Islam (2006) mentioned that tagging of marine turtles at St. Martin's Island and other areas started in 2000 and tagging techniques followed (Balazs, 1999).

In the present study it was observed that various Government departments and NGOs were working with *ex situ* and *in situ* conservation. It was found that *ex situ* conservation was performed through establishing of hatcheries and releasing of the hatchling in the sea while *in situ* conservational steps were not taken extensively. It was only limited in protecting nest by fencing. Rashid and Islam (1999) reported that *ex situ* conservation was common than *in situ* conservation because the eggs being pouched or destroyed by dogs or other animals. It was found that some people of the study area were engaged with turtle business. Most of the people said that Maghs, Hindus ate turtle eggs. They said that Hindus in their area mainly ate the turtle and its eggs. Islam *et al.* (1999) reported that three Hindu families lived on the St. Martin's island, members of these families collected eggs for eating. In 27 June 2011 BBC news published that Officials in Bangladesh said they had seized more than 120kg (18st 5lb) of dried turtles from smugglers near the north-western border with India. IOSEA (2010) published news about illegal business of marine turtle in

Bangladesh. Centre for Advanced Research in Natural Resources & Management (CARINAM) CARINAM team found seven Olive Ridley turtles (*Lepidochelys olivacea*) being illegally kept at a fish trading house in Rupsha, Khulna. The turtles were waiting to be sold to traders who would slaughter them and sell the meat. Researchers said that many people are involved with turtle business and eggs collection. Islam (2001a) found some curio shops sold stuffed marine turtles and paintings on marine turtle shells.

In this study, student group was more or less concerned while two largest groups in terms of respondents were found nearly unconcerned about turtle management and conservation. Majority of local people had no clear idea about sea turtles and its importance. It was observed that turtles were found mainly in the tourist season. Islam (2002) found in his study that the nesting season runs from July until April. In the present study about 45% of the respondent thought that turtles were beneficial and about 40% of the respondent answered turtles were harmful because they ate fish and cut nets and create hazards. The rest of the respondents (15%) answered that they were not sure whether sea turtle was beneficial or harmful. About 62% of the respondents considered that turtle as a bad sign for them and 38% of the respondents didn't think so. Islam *et al.* (1999) identified that the fishing community considered the sighting of a turtle or a turtle getting entangled in the fishing nets as a bad sign. Rajakaruna *et al.* (2009) worked on knowledge and attitude of local people about sea turtles in Srilanka. They found majority of the respondents (73%) had a positive attitude towards sea turtle conservation which does not agree with the present study. Rashid (2011) found that the abundance of sea turtle was reduced from the coast of Bangladesh and this is supported by the present study. However, Islam *et al.* (1999) mentioned that fishermen often killed turtles encountered during fishing activities, and this coincides with the present results. Incidental capture was found one of the major threats to marine turtles in the marine environment. Sometimes fisherman used Turtle Excluder Devices (TEDs) with shrimp trawl net to avoid incidental capture of turtle which could reduce turtle mortality rate. Most of the respondent answered that they did not know anything about TED. Islam *et al.* (1999) found that TEDs were not used on shrimp boats and the government was taking no initiative to impose any regulations regarding TED use. That's why the fisherman did not know much about it. Several threats were identified through direct observation and from the answer of the respondents (Table 5). Majority of the respondents said that turtles were declining day by day. Most of the respondents claimed that fisherman killed the turtles during fishing to save their valuable nets. Some threats were identified from the present study like traditional utilization of turtle product, killing of nesting female through stray dogs and jackals on coastal islands, incidental turtle mortality occurs in trawl nets, drift nets, gill nets, and mesh nets where the turtles get entangled and cannot escape, coastal development, artificial lights etc. Rashid and Islam (2006) identified that the threats to sea turtles in Bangladesh were stray dogs on nesting beaches, incidental capture of turtle, artificial lights, manmade physical alterations such as barriers around the beach etc. Islam (2001b) identified several

causes that are responsible for the decline of turtle populations including deterioration of nesting beaches, high mortality of adults through fishing activities, predation of nesting females and egg collection. Islam *et al.* (1999) reported that threats due to fishing nets and fishing vessels were severe. Sarker (2009) found in his study that thousands of sea turtles come to shallow water areas of the Bay where the males mate with females and the females lay eggs on the beaches nearby. They may lose their breeding ground due to inundation by sea level rise caused by climate change.

Conclusion

The marine turtle populations of Bangladesh appear to be severely depleted as a result of various threats, including direct exploitation for meat and eggs, coastal development, habitat disturbance and fishery by catch. As a conservation point of view, government should take initiatives for community based conservation and management including various awareness programs. As the fishermen were responsible for the death of turtles in the sea, TEDs can be an effective tool for reducing mortality of turtles. An additional syllabus or program can be taken in the school to aware of the students for sea turtle conservation. As nesting ground was reduced for infrastructural development on beaches, measures should be taken for solving this problem. Bangladesh is the mostly vulnerable country for climate change; different methods should be identified for climate change adaptation to protect the biodiversity including sea turtle.

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الواقع الحالي للحفاظ على السلاحف البحرية وإدارتها في مقاطعة كوكس بازار، بنغلاديش

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المستخلص - إجريت الدراسة لمعرفة الواقع الحالي للحفاظ على السلاحف البحرية وإدارتها في مقاطعة كوكس بازار،بنغلاديش. هناك نوعان من السلاحف البحرية تبني اعشاشها في بنغلاديش. لقد عثر على 251 نموذج من السلاحف. لوحظ أن أعلى تعشيش للسلاحف الزيتونية (108) والسلاحف الخضراء (10) في شهر شباط. أنتجت حوالي 21,942 صغيراً وتم إطلاقه في أحواض التفريخ لمرحلة الحفاظ عليها. لقد أختبر مائة شخص بصورة عشوائية للتحدث معهم لتقدير معلوماتهم ووجهة نظرهم بشان الحفاظ على السلاحف البحرية وإدارتها. وكان معظم الذين اجابوا هم (55%) من صيادي الأسماك، (20%) من الطلبة و(8%) من ربات البيوت، وكان (5%) منهم رجال أعمال أما البقية والتي كانت (12%) فهم من الذين يقومون بانشطة أخرى. ويعتقد حوالي (45%) من الناس أن السلاحف كانت مفيدة بينما يعتقد (40%) منهم أنها ضارة. بينما البقية (15%) فكانوا غير متاكدين من فائدة او ضرر السلاحف. لوحظ أن معظم الصيادين لا يعرفون شيئا عن وسائل إبعاد السلاحف (TED) أو إستخداماته. لقد وجد ان تعشيش السلاحف البحرية كان منخفضا وكانت هناك شحة في المعلومات بين الناس في منطقة الدراسة عن أهمية الحفاظ على السلاحف البحرية وإدارتها.

Appendix I Questionnaire

COMMUNITY PARTICIPATION IN MANAGEMENT & CONSERVATION OF SEA TURTLE IN COX'S BAZAR DISTRICT					
Date: Time: Location: Occupation:					
1. Name:			2. Gender: Male ☐ Female ☐		
3. Age:					
1. 0 – 10yrs		2. 11-20		3. 21-30	
4. 31 - 40		5. 41 - 50		6. 51-60 above	
5. Religion:					
6. Educational qualification:					
Elementary only		Secondary only		Higher	
Only can sign		No education			
7. Have you seen a turtle?		Yes:		No:	
8. What do you know about a sea turtle?					
9. Do you identify turtle's eggs? Yes: No:					
10. Do you know the nesting season of turtle's? Yes: No:					
If 'Yes" please specify					
11. How many types of sea turtles have you seen?					
12. Is sea turtle beneficial for us? Yes: No:					
If 'Yes" please specify-					
If 'No" please specify-					
13. Is the turtle indicator of poor omen (bad sign)? Yes: No:					
If 'Yes" please specify-					
14. What do you think about the present status of sea turtle (nesting or found) in your area?					
15. What do you think the causes for sea turtle declining or reducing?					
16. Did you participate any sea turtle conservation related rally, seminar or workshop?					
Yes: No:					
If 'Yes" please specify-					

17. What do you think that sea turtle should conserve or not?
☐ Yes indicate positive attitude ☐ No indicate negative attitude
If 'Yes" please specify-
If 'No" please specify-
18. Do you know if any one is involved in catching turtles/egg stealing?
Only for respondent fisherman
20. Did you ever find a turtle caught in your fishing net? 1. Yes: 2. No:
21. What did you first do when you found a turtle caught in your net?
22. Have you heard about TEDs? 1. Yes: 2. No:
If 'Yes" please specify-