

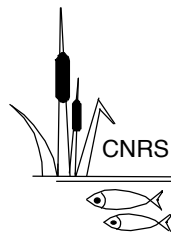
Sea Turtle Conservation and Community Environmental Awareness Program in the Coastal Area of Bangladesh

Final Report

(August 2001 - December 2003)



December 2003



Center for Natural Resource Studies

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1. Introduction

1.1 Background

Sea turtles are the oldest marine creatures roaming around in the ocean all over the world and thus treated as global resources. All species found in international waters become threatened largely due to anthropogenic causes. The sea turtles entirely depend on sandy beaches for nesting, incubation and hatching. The adults make nests for laying eggs in suitable beaches and the hatchlings after emerging from nests around 2 months time crawl to the sea and start their long journey in the vast ocean. Out of seven species of sea turtles in the world, Olive Ridley (*Lepidochelys olivacea*) regularly visits in the coastline of Bangladesh for nesting and the Green Turtle (*Chelonia mydas*) visits occasionally. Nesting of a single individual of Leatherback was recorded in 1998. Since 1998, other species of sea turtles are seen in the Bay of Bengal. However, Hawksbill (*Eretmochelys imbricata*), Loggerhead (*Caretta caretta*) and Leatherback (*Dermochelys coriacea*) have reported to be seen in the coastal waters of Bay of Bengal.

Among other reasons, reduction of nesting places, mortality of adult turtles and poaching & destruction of eggs could be considered as the major threats for the existence of sea turtles in Bangladesh. They could hardly find nesting beaches at this part of the world due to population pressure, expansion of shrimp farms, tourism and other commercial activities in and adjacent to beach areas. Increased fishing intensity in the coastline and lack of concern of the fishers about sea turtles also negatively impacting turtle population in Bangladesh. Lack of community awareness made their life more difficult especially in the nesting sites. Concern for conservation of sea turtles is worldwide and it is imperative that all conservation activists around the world should work in a functional network to conserve sea turtles.

However, encountering all adverse conditions, considerable numbers of sea turtles nest in the Bangladesh coastline across the Southwest (Sunderbans) and Southeast (Teknaf Peninsula). Though the nesting beaches have been intervened and encroached, several important sites remain. Notable sites are the entire St. Martin's Island, Shahparir Dwip in Teknaf Upazila, Inani Beach in Ukhia Upazila, Himchhari Beach and Sonadia Island, Kutubdia Island in Cox's Bazar district, Dimer Char and Dublar Char area located south to the Sunderbans in Khulna district.

Center for Natural Resource Studies (CNRS), leading pro environment NGO, started sea turtle conservation activities in St. Martin's Island and in the Teknaf Peninsula since October 1998. By 2000, CNRS released over 19,300 hatchlings in to the Bay of Bengal. Besides ensuring safe release, CNRS conducted awareness campaigns targeting communities of different occupational groups in the southeast coastline. CNRS also prepared and distributed various awareness materials including leaflets, posters, sun-caps, T-shirts on sea turtles and placed awareness billboards and signboards at different hot spots in this regard. USDA was generous to fund the activities for 18 months (April'99-September'00) through Winrock International. The experiences and the approaches of CNRS in conservation of sea turtles have been shared with peers through presenting oral paper and posters at "International Sea Turtle Conservation and Biology Symposium" held in 2000 and 2001 in Orlando, USA and in Philadelphia, USA respectively. A poster on CNRS turtles conservation activities were also presented in the second ASEAN Sea Turtle Symposium in Kota Kinabalu, Malaysia in 1999.

The Shell Bangladesh Exploration and Development BV (SBED) supported CNRS to continue the work in the southeastern coast of Bangladesh. Shell supported CNRS to carry on sea turtle conservation activities initiated in August 2001 for a period of one year. After completion of the first year, SBED again supported CNRS to carry on the work up to December 2003.

Based on the experience and suitability of the working sites, CNRS concentrated its turtle conservation activities in four sites namely Kutubdia, Inani, Shaparir Dwip and St. Martin's Island. Matarbari under Moheskhali Upazial was dropped due to inaccessibility and security reasons. It is noted that Matarbari is a difficult place where people are mostly involved in fishing and fish related works and most of them are involved various activities. Law and order situation in the area is not appropriate for the out sides to work specially along the beach in the night to watch nesting turtles. Suitable facilities for the accommodation of project staff are also scarce in Matarbari area.

This report presents the activities and achievements made during the period from August 2002 to December 2003. The report also included the relevant achievements of previous phase of the project covering the period form August 2001 to July 2002.

1.2 Project goal

The goal of the project is conserve sea turtle population in Bangladesh through participatory activities involving local communities and related stakeholders. However, the specific objectives of the project are:

- to increase the number of sea turtles in the coastal waters of Bangladesh through beach patrols and hatchery release activities conducted under conditions closely resembling those of undisturbed nests.
- to gather and collate information and data on sea turtles in the Bay of Bengal (Bangladesh) for use in further educational/research activities, dissemination of information and future planning and conservation efforts.
- to support local communities/organizations in having an increased role in the management and conservation of sea turtles.
- to develop a comprehensive sea turtle conservation plan for Bangladesh based on the experience gained.
- to build an increased understanding and awareness of sea turtle conservation and coastal ecology among the general public and related stakeholders.

2. Project Area Description

Sea turtles visit the southeastern and southwestern coastal sandy beaches of Bangladesh for nesting mostly in the winter months. However, the project activities were limited only to the southeastern coast starting from Kutubdia upazila of Cox's Bazar district at the north to the St. Martin's Island of Teknaf upazila of Cox's Bazar district on the south. However, as per the initial assessment of beach sites, actual conservation activities have been located in five sites namely St. Martin's island, Shaparir Dwip at the tip of Teknaf peninsular main land, Inani in Ukhia upazila, and in Kutubdia upazila.

The project activities included night watching of nesting turtles, *ex situ* hatchery incubation eggs, *in situ* nest protection and release of turtle hatchings have been done in all the four locations. Besides conservation related technical activities, awareness campaigns were also conducted in each of the five sites. The project site map is enclosed (Map - 1).

3. Project Activities and Achievements

3.1 Monitoring of nesting turtles

Based on the previous work, CNRS has been able to built good rapport with the local communities, union parishad, local government officials, NGOs and other concerned stakeholders in the area. People are aware of the activities related to sea turtles conservation of CNRS and provided support to the field staff as and when required.

Working over the last five years in the southeastern coast, CNRS gained experience that there is have been clear seasonal patterns in nesting season based on different locations in the coast. In St Martin's Island (off shore island) turtles nest almost round the year with a peak in late winter (February-March), while in Kutubdia Island (near shore island), nesting is done over a narrow band of time starts from January-February and ends in March-April. The nesting turtles visit the mainland beaches viz. Shaparir Dwip, Inani in the winter months ranged from November through February each year.



Considering the variations in nesting time of turtles in different sites, CNRS follow different schedules of monitoring in different locations to conserve the nests and eggs as well as collect related data and information. Based on local situation, monitoring is done round the year in St. Martin's island as nesting is recorded almost round the year while in all other locations monitoring is done seasonally. In all the sites much effort in monitoring is given in winter months when nesting intensity is higher.

3.2 Nesting Season

As usual, nesting turtles started to come to the beaches in the eastern coast of the country almost round the year with peak in the winter months. Similar pattern was observed in the second phase reporting period, which covered the period from July'02 to December'03. Figure 1 shows the numbers of turtles emerged and the numbers nested during the period from July'01 through December'03. Activities during this period were funded by the SBED in two slots.

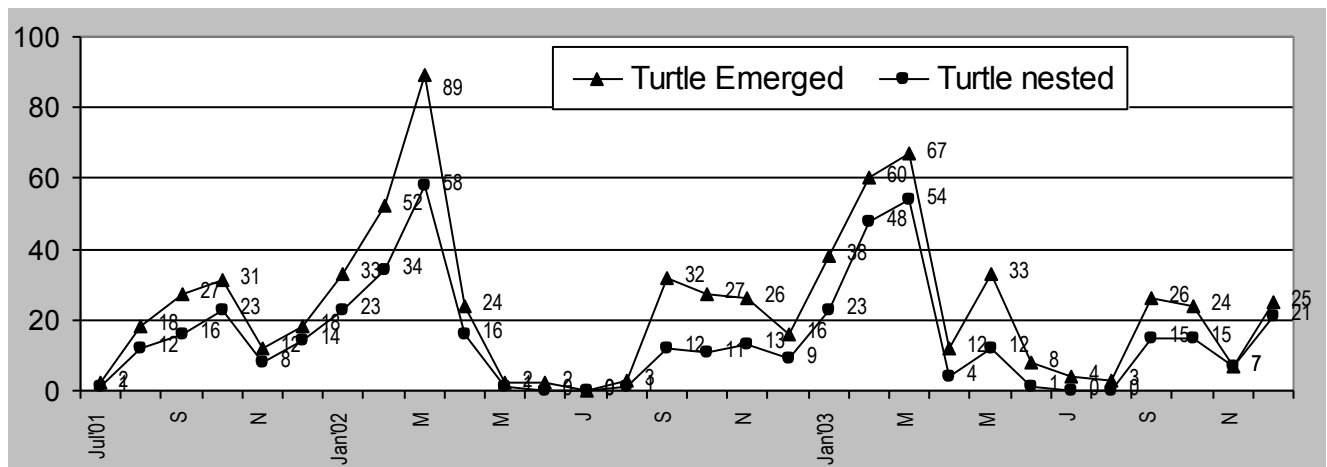


Figure 1: Number of Turtles emerged and nested during July'01-December'03 in all the sites

Data shows that highest numbers of nesting turtles emerged in winter months and peaked in late winter viz. in March in both the year 2002 and 2003. Since March, substantial reduction in numbers of nesting females was observed in both the years (Figure 1). Data shows that 89 turtles emerged in March 2002, which dropped to only 24 in April. Similar trend was also observed in 2003 when 67 turtles emerged in March, which reduced to 12 in April.

Reduction in numbers of nesting turtles observed from early summer viz. April onwards with a slight rise in May'03 and again declined from June. There is almost no nesting in July with exception in 2002 when two turtles visit only in St. Martin's island. The nesting again starts in August and follows the seasonal pattern. Data shows that 18 turtles emerged in August'02 while in the same months only 3 females in St. Martin's Island emerged. Based on the data it can be concluded that the nesting season starts from July-August and end in May-June each year (particularly St. Martin's island). Figure 1 confirms a clear annual trend in the abundance of nesting turtle population in the Southeast coast of Bangladesh

There have been variations in the nesting time observed among the five sites in the southeastern coast. Emergence and nesting of turtles in the St. Martin's Island observed the longest among all the sites where almost round the year turtles come for nesting. Data shows that the turtles starts emerging at the beaches of St. Martin's Island from July and continue up to June of the next year (Figure 1). Although the turtles were emerged in July and August'03 in St. Martin's island, none of them laid eggs.

It was observed that all the turtles come to the beaches do not make nests (failed to make nests and can not lay eggs) due to various reasons. It was observed that in St. Martin's island, turtles trying to dig nests but failed due to presence of boulders under the sand cover. In such cases, turtles attempted to make nests in 2/3 places and eventually they got back to the sea finding no suitable nesting habitats.

3.3 Emergence of Nesting Turtles

As observed, a total of 721 turtles emerged in five sites during the reporting period covering from July 2001 to December 2003 (Table 1 and Figure 2). However, monitoring was done in four sites in the year 2003 as the Matarbari site (remote site) had to drop in 2003 due to various technical problems and non-suitability of the area for conservation purposes.

Based on the observation over the last 5 years, it is revealed that the St. Martin's Island is the most suitable site for the nesting turtles as the higher numbers of turtles visit the island each year. The findings show that 417 turtles (58%) out of the total 721 emerged in five sites visited the island during July 2001 to December 2003 of which 214 were successfully nested (Table 1 and Figure 2).

Table 1: Turtles emerged and nested in five sites during July 2001 to December 2003

Sites	July'01 – June'02		July'02 – December'03		Total	
	Emergед	Nested	Emergед	Nested	Emergед	Nested
St. Martin's Island	147	85	270	129	417	214
Kutubdia	113	87	117	97	230	184
Shaparir dwip	18	12	12	12	30	24
Inani	11	11	12	12	23	23
Matarbari	21	11	0	0	21	11
Total	310	206	411	250	721	456

Another island, Kutubdia is observed as the second suitable site where 230 turtles (32%) emerged for nesting and 184 nested. Other sites in the southeast coast under CNRS monitoring viz. Shaparir Dwip, Inani, Matarbari are found as less suitable in terms of turtle nesting sites. There are however, higher anthropogenic interventions in these areas thus high human disturbance may contribute to the reduced number of nesting turtles. People of the area mentioned in the past (around 15 years back) good numbers of turtles used to visit the beaches when human disturbance was less. As recorded, altogether 30 turtles visited Shaparir Dwip site, 23 in Inani site and 21 in Matarbari site during July 2001 to December 2003 for nesting.

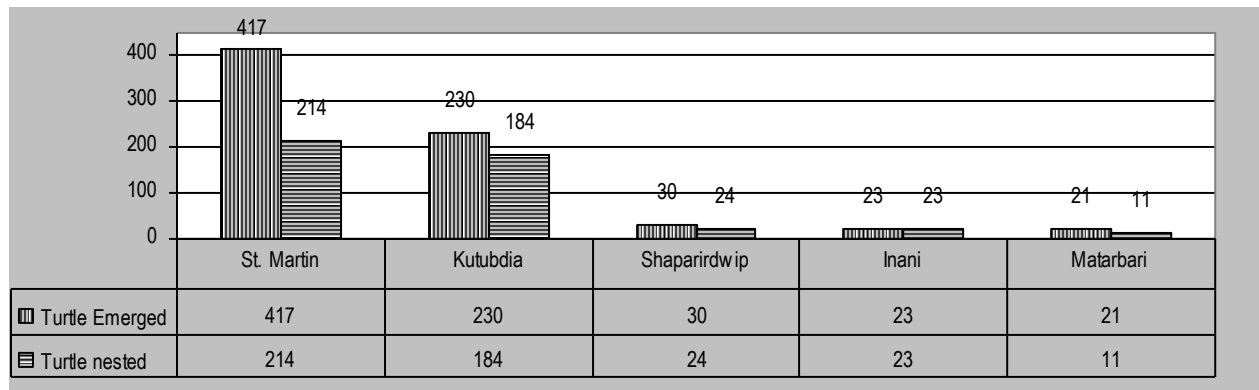


Figure 2: Number of turtles emerged and nested in all sites during July'01 to December'03

3.4 Nesting Success

As observed, nesting successes vary by sites as well as by years. Higher nesting success was observed in 2001-2002 where overall nesting rate was 66% combining all the sites while that was 63% in 2002-2003 nesting seasons (Figure 3). Low nesting success was recorded in St. Martin's island in both the nesting years. Figure 3 shows 58% nesting success in St. Martin's island in 2001-2002, which further dropped down to 48% in the following year viz. year 2002-2003. Human disturbance and presence of sub-soil

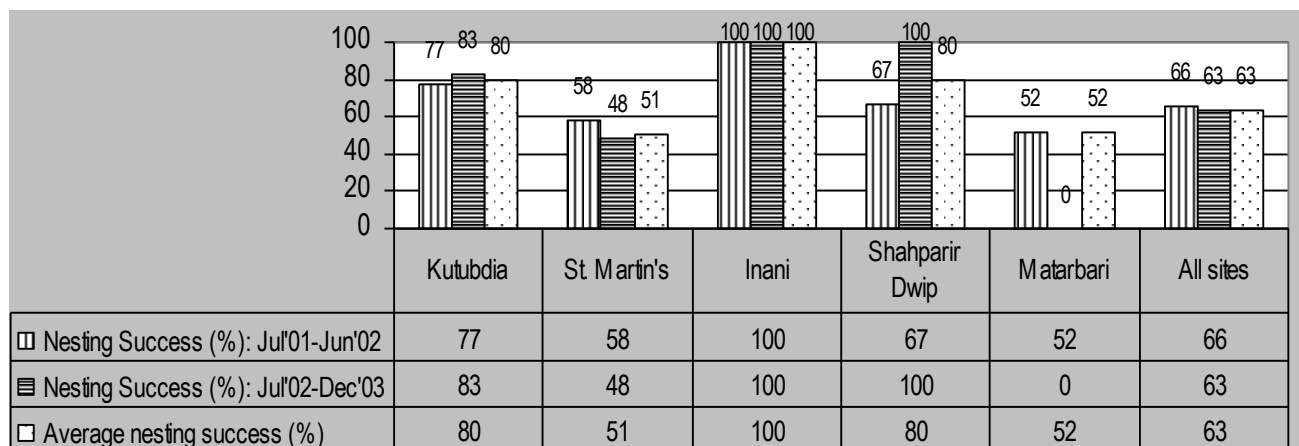


Figure 3: Nesting Success (%) of turtles by sites during July 2001 to December 2003

boulders in the beach found to be the prime reasons for low nesting success in St. Martin's island. However, higher emergence of nesting female in St. Martin's island also increased the probability of nesting failure compared to areas where low emergence female recorded. Highest nesting success of

100% was recorded in Inani beach in both the nesting years. Average nesting success of 80% was observed in Kutubdia & Shaparir Dwip and 52% in Matarbari site. Combining the data of 2 years, the lowest of average success of 51% was recorded in St. Martin's island. The average overall nesting success was recorded 63% combining all the sites in two years (Figure 3).

3.5 Species of Nesting Turtles

Majority of the turtles nesting in the southeastern coast of Bangladesh are Olive Ridley turtle. A few individuals of green turtles are also visit Bangladesh beach for nesting. As observed, they only come to the beaches of St. Martin's Island and occasionally in the Shaparir Dwip. In 2001-2002, 47 green turtles emerged and that only in St. Martin's island. Of the 47 emerged, only 14 were successfully nested (30%) in the beach (Figure 4).

In the following year (viz. 2002-2003), 60 green turtles emerged in St. Martin's island and in Shaparir Dwip for nesting. Of the 60 female, only 16 recorded to have nested. The nesting rate was only (27%).

Altogether, 107 green turtles emerged in St. Martin's island in Shaparir Dwip and only 30 of them successfully nested. The overall nesting success was, therefore, 28% combining the record of two years (2001-2002 and 2002-2003) while the nesting success for the Olive Ridley was 63%.

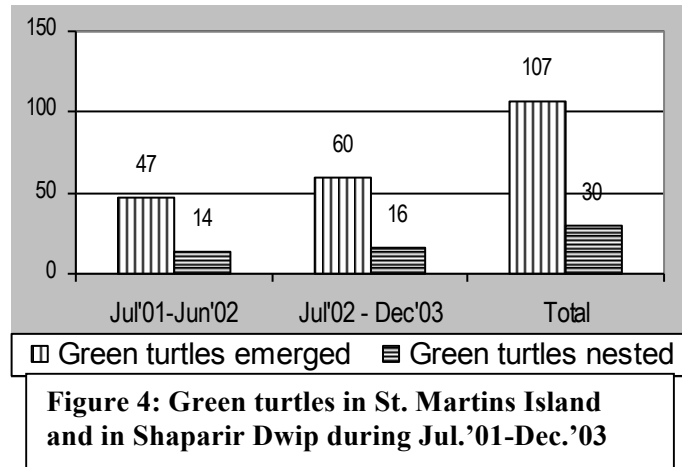


Figure 4: Green turtles in St. Martins Island and in Shaparir Dwip during Jul.'01-Dec.'03

Nesting success of green turtle was found not better compared to Olive Ridleys. Reasons for lower laying rate of green turtles are not known. However, the emerging site of green turtles is different from that of Olive Ridleys. It was observed that the sites where the green turtles emerge not having gentle slope like the sites of Olive Ridleys rather presence of high ridges, which often the green turtles can not cross to reach suitable sandy sites for nesting. Green turtles emerged only in two spots in St. Martin's namely Badam Gonia (most) and Silbunia (least) while the Olive Ridleys emerged in 7/8 sites in the island with the maximum in Silbunia site.

3.6 Eggs Preserved

The conservation focus of the program is to protect the eggs after laying whether in the nest or in hatchery, ensure successful hatching of eggs and then to release the hatchlings to the sea. The eggs are conserved in two ways viz. protecting the eggs in original nests where the turtles laid eggs and the other way is to collect the eggs (soon after laying by the turtles) and rebury the eggs (artificial egg chambers) to safe locations in hatchery (enclosure) until hatching.

The monitoring data shows that a total of 47, 587 eggs have been incubated in five locations during the reporting period from July'01 to December'03 (Figure 5). Of the total eggs incubated, 22,614 were incubated during the period from July 2001 to June 2002 and 24,973 eggs in July 2002 to December 2003 in five sites.

Out of the total eggs of 22,614 incubated during period covering July'01 to June'02, the maximum of 9,734 were in Kutubdia island, followed by 9,497 in St. Martin's island and then 1,424 in Inani, Ukhia, 1401 in Shaparir dwip and 558 in Matarbari, Moheskhali island (Figure 5 and Table 2). It is however, noted that 668 eggs from Matarbari hatchery was stolen immediately after keeping in the hatchery.

Of the 24,973 eggs were incubated during the period from July'02 to December '03, the maximum of 11,398 eggs were incubated in St. Martin's island followed by 10,656 in Kutubdia island. It is noted that monitoring is on going and more eggs would be collected in Kutubdia by March 2004 (table 2 and Figure 5). In two other sites named Inani and Shapariri dwip around 1,450 eggs were collected and preserved for incubation. In the Inani site all eggs were kept *in situ*.

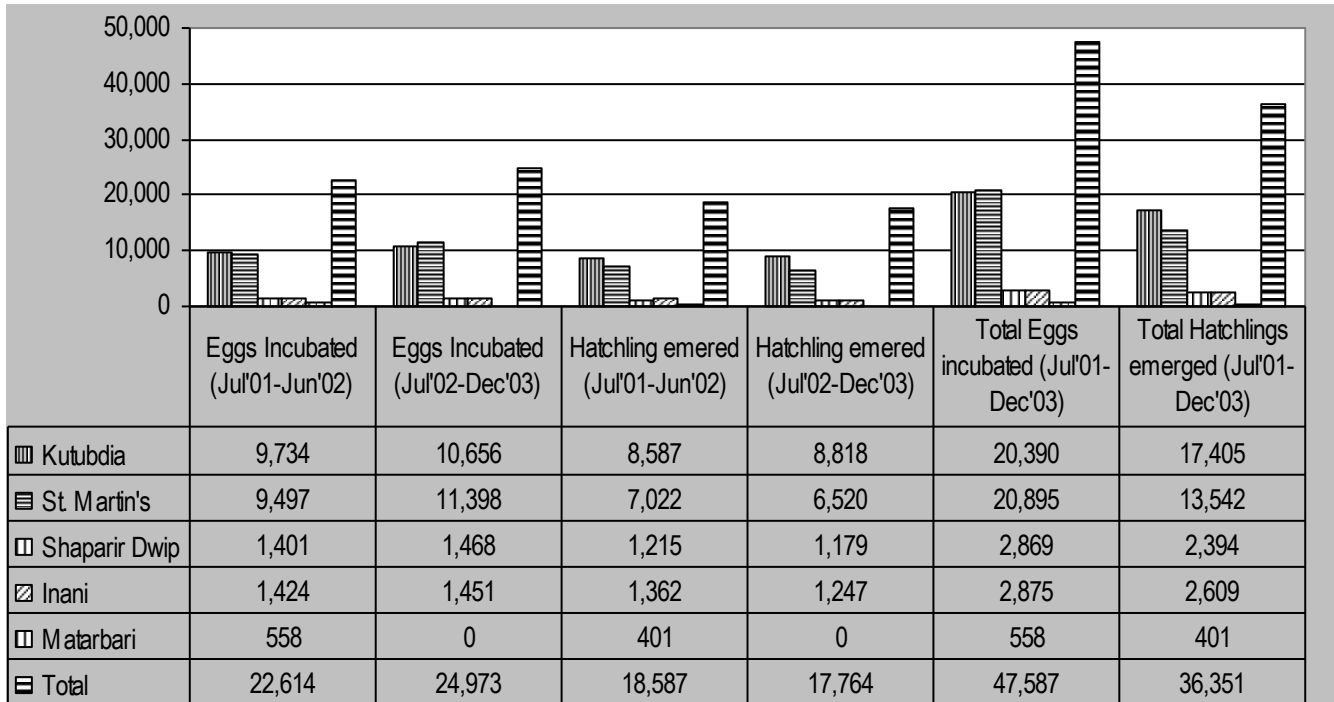


Figure 5: Number of eggs incubated and of hatchlings emerged during July 2001 to Dec'03

It is worth mentioning that during the whole reporting period covering July 2001 to December 2003, a total of 8,706 were incubated in *in situ* condition where eggs were protected in original nest and 39,548 eggs were collected from the nests and incubated in *ex situ* condition (eggs were incubated in the hatcheries).

3.7 Hatching Rate

Hatching rate vary by sites and in *ex situ* and *in situ* conditions. Data shows that higher average hatching rate was observed in *in situ* conditions than in *ex situ* condition.

Table 2 shows that over 92% hatching rated was recorded in 2001-2002 seasons compared to about 80% in the *ex situ* condition in the same year. Similar trend was also



observed in the following year (viz. 2002-2003) where about 87% hatching rate was recorded in *in situ* condition compared to about 68% in the *ex situ* condition. The overall hatching rate combining the two years (July'01 to december'03), highest of over 89% was observed in *in situ* condition compared to over 72% in *ex situ* condition (Table 2). The overall hatching rate combining both *ex situ* and *in situ* conditions as well as all sites was recorded over 76%.

There have been various factors influence hatching of eggs in *ex situ* and *in situ* conditions depending on locations, temperatures, handling of eggs and other associated factors. However, hatching rate will be finally calculated at the end the nesting season when incubation period will be over for all the eggs kept for incubation in hatchery nest and in *in situ* conditions June 2004.

Variation of hatching rate in *ex situ* and *in situ* is always observed, as the *in situ* condition is better. *In situ* condition, the original nests are retained and therefore problems associated with collection of eggs from the original nest, carrying them to hatchery site and reburying the eggs in the egg chambers in the hatchery is avoided. In *ex situ* condition, the eggs may get damaged during collecting, carrying and reburying in the hatchery nests.



3.8 Release of Hatchlings

During the entire project period covering from July'01 to December'03, a total of 36,351 turtle hatchlings were safely released in the sea from both *in situ* and *ex situ* conditions from five sites (Table 2). Of the total hatchlings released, 7,779 were from the *in situ* conditions and 28,572 from the *ex situ* conditions.

Table 2: Eggs incubated in hatchery and *in situ* conditions and hatching rate (%) during July'01 to December'03

Sites	Eggs Incubated			Hatchling Emerged/released			Hatching Rate (%)		
	<i>In situ</i>	<i>Ex situ</i>	Total	<i>In situ</i>	<i>Ex situ</i>	Total	<i>In situ</i>	<i>Ex situ</i>	Total
July 2001 – June 2002									
St. Martin's	458	9,039	9,497	425	6,597	7,022	92.79	72.98	73.94
Shaparir Dwip	1,401	0	1,401	1,215	0	1,215	86.72	0.00	86.72
Inani	1,424	0	1,424	1,362	0	1,362	95.65	0.00	95.65
Matarbari	120	438	558	108	293	401	90.00	26.59	32.82
Kutubdia	843	8,891	9,734	803	7,784	8,587	95.26	87.55	88.22
Total (01-02)	4,246	18,368	22,614	3,913	14,674	18,587	92.16	79.89	82.19
July 2002 – December 2003									
St. Martin's	0	11,398	11,398	0	6,520	6,520	0	57.20	57.20
Shaparir Dwip	914	554	1,468	743	436	1,179	81.29	78.70	80.31
Inani	1,451	0	1,451	1,247	0	1,247	85.94	0.00	85.94
Kutubdia	2,095	8,564	10,656	1,876	6,942	8,818	89.54	79.89	82.73
Total (02-03)	4,460	20,516	24,973	3,866	13,898	17,764	86.68	67.74	71.12
Overall (01-03)	8,706	39,548	47,587	7,779	28,572	36,351	89.35	72.25	76.39

Of the total hatchlings released, 18,587 (51%) were released from five sites during the period from 2001-2002 while 17,764 (49%) released during the period from 2002-2003 from four sites (Matarbari site was

dropped in 2002-2003 program). It is noted that many eggs are still in incubation and expected that more hatchlings would be released out of the eggs collected during the year 2002-2003.

Site wise hatchling release data shows that the highest numbers of hatchlings have been released from Kutubdia numbering 17,405 contributing 47.88% of the total hatchlings released over the last two years. The next site in terms of numbers of hatchlings released ranked the St. Martin's island from where 13,542 numbers of hatchlings were released which is 37.25% of the total hatchlings released from five sites in two years. Inani ranked third, released 2,609 hatchlings followed by 2,394 and 401 in Shaparir dwip and Matarbari respectively (Figure 6).

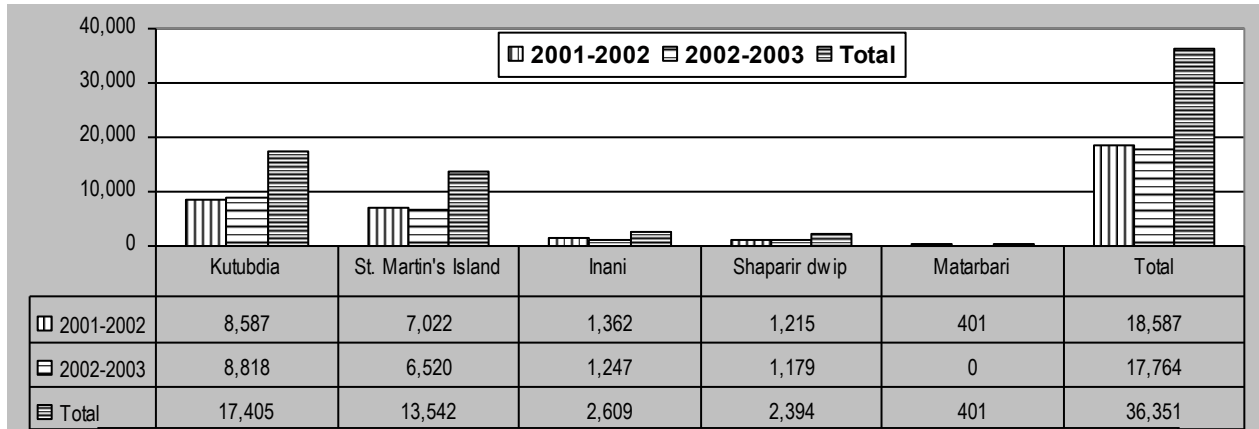


Figure 6: Total hatchlings released from five sites during July'01 to December'03

3.9 Dead Turtles

Every year, mostly during winter season huge number of dead turtles washed ashore in the southeastern coast of the country. CNRS keeps record of dead turtles in its working beaches in all the five sites viz. St. Martin's Island, Shaparir Dwip, Inani, Matarbari and Kutubdia. Matarbari site was dropped in the year 2002-2003.

It was observed that a total of 289 dead turtles were observed during July 2001 to June 2002 in five sites. Of the total dead turtles observed 251 (86.85%) was found in winter viz. December'01 through February'02 with a peak in January 2002 numbering 109 i.e. 37.72% of the total (Figure 7).

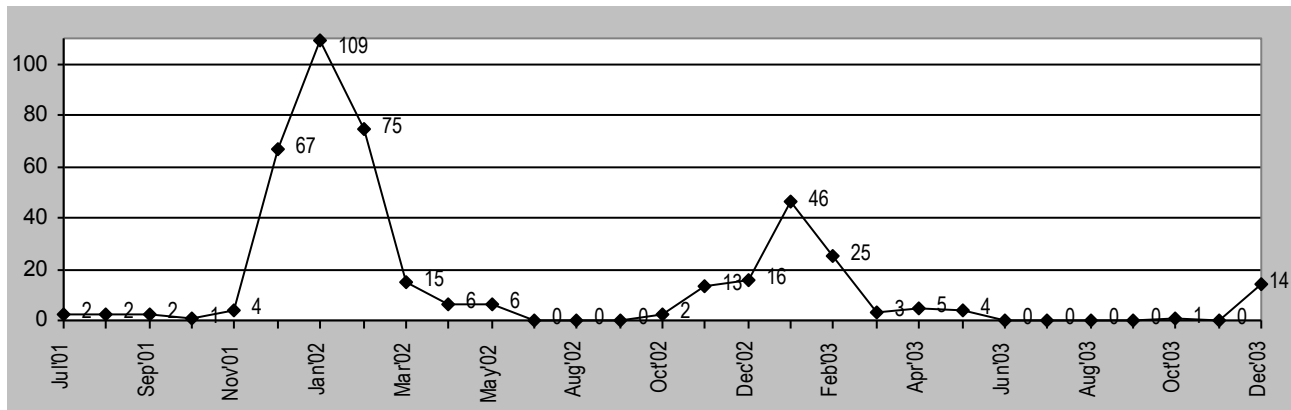


Figure 7: Numbers of Dead Turtles observed in 5 sites during July 2001 to December 2003

In the following year (2002-2003) number of dead turtles was found less compared to previous year (2001-2002) in all sites. Data shows that a total of 129 dead turtles were observed during July 2002 to December 2003 in four sites. Of the total dead turtles observed 87 (69.04%) was found in winter viz. December'02 through February'03 with a peak in January 2003 numbering 46 i.e. 36.51% of the total (Figure 7).

Of the total dead turtles of 289 found in five places during period from 2001-2002, maximum number (126 numbers) was recorded in Kutubdia followed by 110 in Matarbari, 26 in Shaparir Dwip, 14 in Inani and 13 in St. Martin's island (Figure 8).

Similar trend was also observed in the following year. Data shows that of the total of 129 dead turtles found in four places, maximum number of 84 numbers was recorded in Kutubdia followed by 19 in Inani, 17 in St. Martin's Island and 9 in Shaparir Dwip (Figure 8). It indicated that turtles in the coastal water near Moheshkhali and Kutubdia islands are at high risk of mortality.

Monitoring findings indicated a reducing trend in the incidents of occurrence of dead turtles in the southeastern coastal areas of Bangladesh. As recorded number of dead turtles have been found reduced from 289 observed in 2001-2002 to 129 in the following year (2002-2003). However, in the year 2002-2003 monitoring was done in four sites instead of five sites covered in 2001-2002. The Matarbari site was not monitored in 2002-2003. To compare the data between years, we dropped the data of Matarbari site and found that higher mortality of 179 dead turtles in 4 sites (excluding 110 found in Matarbari site) in the year 2001-2002 compared to 129 dead turtles recorded in 2002-2003 in the same 4 sites.

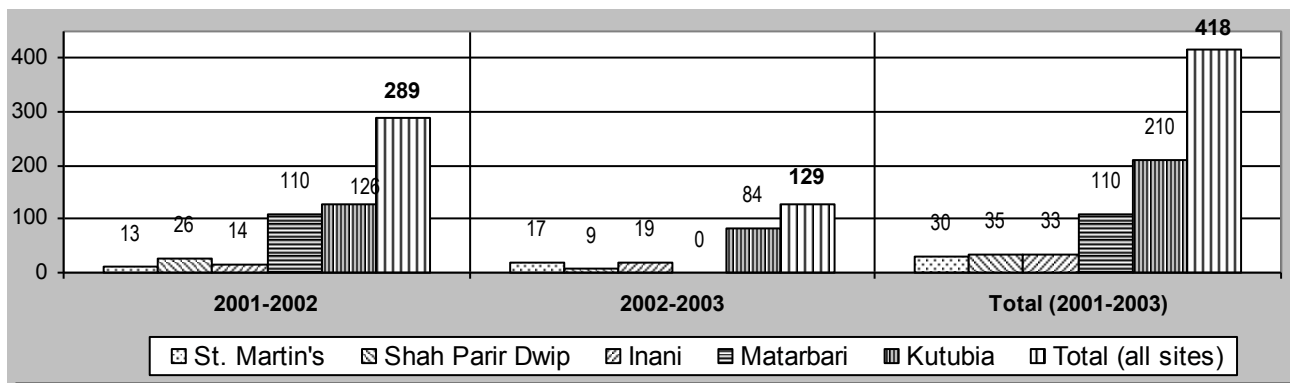


Figure 8: Number of Dead Turtles observed in five sites during July 2001 to December 2003

All the dead turtles found in the beaches are adult and thought that they were heading towards the coastal beach for nesting. In all the places, the local people, particularly the fishers were asked about the reasons for dying of turtles.

It was learned that most of turtles died in the sea. Dogs and children also considered as one of the causes of killing of turtles in the beach. However, due to awareness campaigns of CNRS in project sites, killing of turtles by human has been reduced to almost zero. But killing by dogs in some places has still been reported.

The fishermen in the area also mentioned that they often kill the turtles when the turtles get entangled with their fishing nets in the sea. Most of the turtles are entangled in *bhasha jal*. The fishers mentioned that no body told them about the protection and importance of turtles and therefore they did not take any care rather kill these animals to get rid off the problems quickly.

3.10 Threats to Sea Turtles

There are various forms of threats to nesting sea turtles in Bangladesh on the beaches and in the sea. Major threats as experienced are mentioned as under:

- Degradation of nesting beaches (alteration and erosion, boulders beneath the sand, collection of shell and coral)
- Predation of nests/eggs by dogs, lizards,
- Mortality of adults by deep sea fishing vessels/nets
- Shrimp fry collection (day and night) along the beach
- Lighting at the beach from shrimp hatcheries
- Increased population pressure and lack of awareness
- Of all threats, egg stealing, nest predation and fishing nets can be rated as most serious problems

3.11 Awareness Campaigns

3.11.1 Awareness Sessions

Major threats to sea turtles in Bangladesh are stealing of eggs, disturbance & killing of nesting female on the beach and killing of turtles in the sea due to entanglement in fishing nets. Lack of awareness among the fishers, mass people and concerned stakeholders including policy makers has been considered as important effort to conserve sea turtles in Bangladesh. Keeping this in mind, CNRS has been conducting awareness campaign among the concerned communities at local level since inception of the program in 1998. During the reporting period various awareness campaign has been conducted at each of the four conservation sites viz. St. Martin's Island, Shaparir Dwip Inani and Kutubdia (Table 3).

The Environmental Awareness Programs were organized at schools, UP office premises, *Madrassa* and house courtyards. Project staff and local resource persons like schoolteachers, UP Chairmen and members, Imams, facilitated the awareness sessions. A total of 8 awareness sessions have been conducted during the reporting period.

Topics Discussed

Based previous experience and module developed, following topics were discussed and shared with the participants in each of the awareness campaign:

- Coastal environment and biodiversity conservation
- Environmental pollution including threats to coastal biodiversity
- Sea life with particular reference to sea turtle conservation
- Shrimp fry collection and destruction of other aquatic biodiversity
- Habitat, status and life cycle of sea turtles including nesting behaviors at the coast line
- Measures for conservation of sea turtles
- How the participants could take part in sea turtle conservation activities.

The awareness campaigns targeted grassroots level professional groups like fishers, shrimp fry catchers, farmers and women & children.

Table 3: Awareness programs conducted at different sites during September'02 to February'03

Date	Venue	Facilitators	Participants
12 Sept.'02	Silbunia, St. Martin's Island	Project staff and UP Member	27
28 Oct.'02	Shaparir Dwip (Majher Para)	Project staff & Head Master, primary school	32
04 Nov.'02	M. Shafir Beel, Inani	Project staff and UP Chairman	24
08 Nov.'02	Sete Para, Kutubdia	Project staff and UP Chairman	39
15 Nov.'02	Ali Fakir Dail, Kutubdia	Project staff and Imam	26
27 Nov.'02	Kudir Tek, Kutubdia	Project staff and UP Member	23
12 Dec.'02	Konapara, St. Martin's Island	Project staff and UP Member	19
27 Feb.'03	Uttarpara, St. Martin's Island	Project staff & Head Master, primary school	25

3.11.2 Awareness Materials

Billboards and signboards have been placed at different potential locations with messages relevant to sea turtles conservation during the previous phase of the project supported by SBED. During this period, only maintenance works of these boards have been accomplished. Numbers of signboards have been placed from Chokoria to Saint Martin's Island is mentioned below:

- Boroghop Feri Ghat in Kutubdia
- Boroghop beach in Kutubdia
- Ali Akber Dail beach in Kutubdia
- Matabari in Moheshkhali
- Laboni beach in Cox's Bazaar
- Kolatoli beach in Cox's Bazaar
- Inani beach in Cox's Bazaar
- Shahaparir Dwip in Teknaf
- Teknaf beach and St. Martin's beach

A booklet on sea turtles have been finalized with pictures and messages relevant to biology, ecology and behavior of sea turtles as an education material. The book let incorporated existing threats to sea turtles and conservation measures in the coastline of Bangladesh. The booklet is now under review. It is planed to incorporate the relevant data on turtle conservation of the current nesting season viz. covering the data up to May 2004.

Therefore, it is expected that the booklet (including technical data) would be printed by the end of June 2004. The booklet will be widely distributed among the concerned communities and stakeholders.

4. Project Management

The project was implemented by a team of 16 members headed by a Project Officer (Marine Biologist) based in Dhaka. The field team composed of 15 members headed by a Field Biologist/Officer based at Teknaf but frequently pay visits to other three sites. Other team members included community motivators, turtle watchers and hatchery guards/operators. Of the 15 staff in the field, 13 were local people and only 2 from out side.

The whole team was under direct guidance of the Executive Director, CNRS who is also a biologist by training and Natural Resource Management Specialist by experience of over 20 years. Staff position of the project is presented in Table 4.

5. Concluding Remarks

Based on the experiences it is worth mentioning that a good numbers of sea turtles still come to the sandy beaches of Bangladesh for nesting. Turtles nests almost round the year but peaked in winter months. As observed only two species of turtles come for nesting of which majority are Olive Ridley and a few green turtles. Olive Ridelys nest in all the sites but green turtles come mostly in St. Martin’s Island and occasionally at Shaparir Dwip.

Table 4: Project Personnel

Staff Positions	Number
1. Project Officer/Biologist	1
2. Field Biologist	1
3. Field Trainers	1
4. Local Turtle Watchers	13

CNRS has gained good experience in the area of sea turtle conservation in Bangladesh over the last 5 years in all the nesting sites in the Southeastern coastline starting from Kutubdia in the north to the St. Martin’s island in the south. In accomplishing the activities CNRS receives financial support from the USDA through the BREAD project of Winrock International and SBED. In the course of project activities CNRS has been able to draw attention of MOEF (ministry of Environment and Forest) through its St. Martin’s Island Marine Park Project and Coastal & Wetland Biodiversity project/GEF/UNDP and FAO (through ECFC project). CNRS also disseminate the activities and experiences among the international communities through attending and presenting papers in the international sea turtle conservation symposiums.

In St. Martin’s Island, MOEF started turtle conservation activities over the last three years and it is a good sign that the government has given due consideration to this important work. CNRS desires that the MOEF would continue to do this work on a regular basis and thus this work would be incorporated as a mainstream activity of the Ministry in the coastal area. Considering the fact, CNRS, in future, may scale down its conservation activities at the Island but share and use the information and experience for application in other sites (non-MOEF sites) as well as in developing wider conservation plan and strategies.

It is concluded that the pro-active role has taken by the MOEF in this work is a positive indication that the CNRS activities in sea turtle conservation has been able to drawn attention of the concerned government agencies. However, long-term collective effort is necessary to institutionalize the sea turtles conservation activities for achieving sustained community-focused conservation initiatives in Bangladesh.

6. Future Plan

Based on the experience and skills developed in the area working over the last 5 years, CNRS wishes to continue the activities of sea turtle conservation in the coastal area of Bangladesh in future. To this end, CNRS keeps close contacts with the FAO/ECFC project and GEF/Coastal & Wetland Biodiversity Conservation Project for future collaboration and support. CNRS is also keen to continue this work with the SBED and its partners in the southeast as well as in other suitable areas in the Southwest coast of Bangladesh.

In order to carry out the conservation in the future to come, CNRS has been planning to generate operational costs of turtle conservation activities through mobilizing local resources. With support of SBED, CNRS has started constructing a low cost community center-cum-guesthouse at St. Martin’s

Island in 0.30 acres of CNRS own land to generate revenue. The lay out plan of the center is enclosed in Appendix 1. This center will be used for turtle research activities and a museum, which will contribute the training and awareness activities. This center will also serve the purpose of accommodate for the tourist who visit the island. It is noted that the island is a good tourist place and there is potential for good revenue generation through renting accommodation facilities for tourists in the Island. It is expected that the guesthouse would be completed by April 2004. Similar attempt will be taken in Kutubdia Island or in any suitable site Cox's Bazaar in the next year (2005), as these areas are also good place for tourist attraction.

However, the present support of the SBED has been over on 31 December 2003. It is underlined that this is the peak time for turtle nesting and protection (January-March) in Bangladesh coastline. We therefore, request the SBED to extend its support to CNRS in carrying out the activities without interruption from 2004 onwards. We also request the SBED to support CNRS for building one community center-cum-guesthouse in Kutubdia or in Cox's Bazaar so that the revenue to be generated out of the center can be used for meeting up the operational costs of sea turtle conservation activities. This effort would help sustain the activities in future.

CNRS would continue to involve the local government bodies and local government officials including MOEF to consider sea turtles conservation issues in any development planning and project formulation in the coastal area.