

SEA TURTLE CONSERVATION PROGRAM IN ST. MARTIN'S ISLAND BY CARINAM: A BRIEF REVIEW

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Marine turtles are internationally protected and currently, worldwide, all seven species are listed in the IUCN Red Data Book of threatened species. They are well-known for their remarkable life history, some parts of which are still unknown to science. They are migratory and travel thousands of miles for feeding and nesting. Five species have been reported to occur in the territorial waters of Bangladesh, viz., *Lepidochelys olivacea* (Pacific ridley), *Chelonia mydas* (Green turtle), *Eretmochelys imbricata* (Hawksbill turtle), *Caretta caretta* (Loggerhead turtle) and *Dermochelys coriacea* (Leatherback turtle) (Ahmed *et al.*, 1986; Husain, 1976, 1979; Khan, 1982, 1982a, 1985, 1987; Rashid, 1986, 1986a, 1987, 1997; Sarker & Sarker, 1988).

Few of the turtle nesting beaches are well known, a situation that signals the need for more detailed study along the coastline and offshore islands, viz. Mandarbaria, Dubla Island, Egg Island and Putney Island of Sunderban, Sonadia, Moheskhal, Inoni, Kocchopia, Bordail, Monkhali, Southern Teknaf at Sahporir dweep and St. Martin's Island.

So far, three species of marine turtles have been reported to nest on the beaches of St. Martin's island, although since no other records over the last fifteen years are available the data needs to be updated. Rashid (1989) recorded 35 individuals of Pacific Ridley per night coming to nest on the beach of St. Martin's island. Of all the nesting sites along the coast and the offshore islands, St. Martin's island is still considered to be the best habitat for nesting marine turtles. Most of the local people remember the frequent nestings 10-15 years ago.

Bangladesh's neighbouring countries

also receive nesting sea turtles and the animals receive protection all over, except for in Bangladesh. Therefore, it is a very significant period for sea turtle conservation in Bangladesh territories as to whether we will conserve this creature here, and a decision is needed immediately.

The forest department is under the aegis of the Ministry of Environment and Forest (MOEF), the sole authority for the protection and conservation of all wildlife in the country. Even though the sea turtles are under the mandate of their protection, they are not included in the list of protected species (Schedule III) of the Bangladesh Wildlife (Preservation) Amendment Act, 1974, (BWPA). In a revised government notification, all wildlife species are protected and the government from time to time, through gazette notification, will announce which species will be liable for any form of exploitation or trade. None of the beaches are currently protected; however, two sites in the Sunderbans legally fall under the protected areas category, but there is no enforcement of any law regarding beach activities. Although these sites are under intense fishing activity during the nesting season, nocturnal activities are restricted due to the fear of Bengal tiger (*Panthera tigris tigris*) which is a blessing for the sea turtles.

In order to save the turtles that still come to nest on the beaches of St. Martin's island from extinction in the near future, a group of environmentalists from the NGO "CARINAM" (Centre for Advanced Research in Natural Resources & Management) have been working at St. Martin's island since October 1996, setting up a Marine Turtle Conservation Program (MTCP) on the island. There are several NGOs working exclusively for the

conservation of nature, but CARINAM is the only one which has a marine turtle conservation program and is the only NGO working on St. Martin's island. The ongoing research and conservation activities (MTCP) were initiated with the support of the IUCN/SSC/ Marine Turtle Specialist Group (MTSG). CARINAM established the country's first scientific sea turtle hatchery on the west beach of the island.

Many turtles are caught in local fishing nets where they slowly suffocate, and some of the islanders are engaged in the illegal sale of turtle eggs to neighbouring Myanmar and also to the tribal people inside the country. On the island itself, the increased building of barriers have seriously reduced the nesting ground area to only a small stretch of beach. There can be no doubt that if this magnificent animal is to be safeguarded from eventual extinction, then comprehensive, focused and integrated efforts must be taken.

CARINAM develops, supports and implements the programs that promote the restoration and survival of turtle population in the territorial waters of Bangladesh and the areas that fulfill their ecological roles. Basic tasks of CARINAM/MTCP include: a) conserving and managing natural resources and habitats that are fundamental for marine turtles; b) emphasizing management for the long-term survival of the species; c) recognizing that sea turtles are a shared global resource; d) involving the local community in conservation management; e) seeking assistance and support from people and organizations interested in the conservation of marine turtles; f) integrating local, regional, national and international efforts through advisement and advocacy; g) helping to build the capacity of concerned authorities to conserve marine turtles; h) assess the status, ecology, and level of exploitation of marine turtles in St. Martin's island; i) identify activities which have, or are likely to have, a deleterious impact on the island's ecosystem in general and marine turtles in particular; j) hold consultations with the local people to set up a sea turtle hatchery; k) design and develop turtle conservation education programs in the local

schools and prepare education materials on a participatory approach basis; l) initiate consultations with the local fisherman on the use of the Turtle Excluder Device (TEDs); m) on the basis of collected data and the synthesized information obtained through people's participation, suggest a management plan for the marine turtles on the island. CARINAM/MTCP will extend its work to other spots along the entire coast where turtles usually nest.

St. Martin's Island: The Project Area

St. Martin's island, also known as Narikel Jinjira, is a small offshore island of about 600 ha, located about 10 kms south of the Teknaf peninsula in Cox's Bazar District. This is the country's only island that still has a diverse coral reef in the shallows surrounding the island from the northwest to the southeast covering the western side. It is mostly overexploited. The island lies between 20°33'-20°40' N and 92°17'-92°22' E: the subtropical monsoonal climate that prevails over Bangladesh chiefly controls the weather of the island, which is influenced by tropical and subtropical climate since it is located in the tropical belt (northern). The relative humidity ranges from 67%-90% and the temperature is greatly influenced by the sea and the saline environment. However, previous records of rainfall of Cox's Bazar ranged from 239-309 mm in the pre-monsoon period (March - May). June and July receive the southwest and southeast monsoon climate which is characteristically warm, humid and sometimes with up to 1000 mm of rainfall in a single month. Since St. Martin's island is situated about 12-14 km south in the sea, the tidal level can be slightly higher than Naf estuary. The aerial view of the island shows it to be dumbbell-shaped. The surface area of the land, including the beach, is 9 to 10 square km depending upon the tidal level. Besides this, the whole island surround by millions of sedimentary rocks, with a few exceptions at the north-northeast portion. Normally the rocks extend seaward after the sandy beach and in some places (such as west side), extends up to 1 km. There are three other small islands the south of the main island which

remain separated from mainland during high tide. The northern part Uttarpara ends at a narrow point called Golachera, which is only 50 m wide. The broadest part of the island identified at Uttarpara is no more than 1.2 km. During the monsoon to pre-winter period, a large shallow lagoon is located at Uttarpara that is connected to the sea in the west by a narrow channel; it serves as a fishing ground for most of the period and a very good harbor for winter birds like gulls, terns, herons, etc. The entire coastline of the island is fringed by rocky intertidals. These are basically the base rock of the island in origin. Some spherical boulders of calcareous concentration and coral boulder/dead coral colonies are present too. The base of the island is sedimentary rocks composed of Gurijan clay, shale and silty shale, grey to bluish grey in color, interceded with subordinate calcareous and fossiliferous sandstone origin (Aktar, 1992), but not of coral; only live coral reefs are around the island (Khan, 1964, 1991). The entire shoreline is bordered by dense *Pandanus*; sand dunes and flat grounds are covered by *Ipomea*.

Results & Discussion

CARINAM went through a very critical stage at the opening of the program. After consultations with the local leader and administrative personnel, viz., the union chairman and members, police, BDR and other local people. CARINAM/MTCP began its task gradually. First of all they identified local people who were directly engaged in the illegal trade of turtle eggs, as well as in the overall exploitation of the sea turtles. It was found that only some of them were Hindus directly remain engaged in the egg trade during the nesting season. Only three Hindu families live on the island and all are involved in the exploitation. Some Muslims were also engaged in the same activities. Meanwhile, some non-islanders, with the cooperation of some islanders, tried hard to prevent CARINAM from initiating the program. This group tried to convince the people that the newly arrived turtle workers (MTCP) were their enemy. They also prevented the MTCP signboard from being erected on the beach. Still, we managed to execute our tasks with the help of the islanders.

The first step, along with the observation of nesting females, was to set up the Sea Turtle Hatchery on the beach. We motivated the people to be aware and to understand the CARINAM/MTCP objectives. We even employed some of the egg sellers. With the participation of the local people, CARINAM/MTCP spent one and half years on St. Martins from October 96. Two nesting seasons as such were included in the observations.

Observations Of Nesting Turtles: To observe the nesting turtles, we traversed 14 km of beach at night on a continuous basis; 4-5 persons per night for 5-6 hours between 1800-0600 hours, the observation time changing in response to the tide. With regard to the previous records from the local egg collectors, most of the time was spent on the west beach. At night the beach was bright due to moonlight, and at other times the light from huge stars was enough to traverse along the shore. The influence of lunar, tidal and wind conditions on nesting behaviour were recorded. Due to continuous threats, only a few spots are now suitable as nesting habitat.

From October 1996 to March 1998, 215 female turtles were recorded to nest successfully. Only 3 individuals were found to nest in winter and the time of greater precipitation, which normally starts from April. Major spots have been identified. Rock barriers along with the edge had a serious effect on the nesting activities. The Spring tide almost covers the beach and the turtles usually try to cross the dunes through a short corridor in the sandbar to get to the dry sand to make a nest. Boulders were found to interrupt nest making in some spots. Turtles usually try more than once to make complete nest.

About 207 Pacific Ridley and eight Green Turtle females were recorded to nest successfully; only 73 females were encountered while surveying. *L. olivacea* and *C. mydas* were observed to have different nesting site preferences. The *C. mydas* nesting beach (local name: Badam Gonya), was confined to a very small stretch of the south western beach where the sand grains are relatively big and coarse compared to that of other parts of the island. The

lower end of the slope is a flat base fully covered by rocks. Green turtles were only found to nest during spring tide, when the high tide attains half of the slope. Ten spots have been found to be nesting sites of *L. olivacea*, including Badam Gonya. The curved sandy beach named Shil Banyar Gula (GPS location 20°36.572' N Latitude 92°19.512' E Longitude to 20° 36.186' N Latitude, 92° 19.483' E Longitude), 1 km long at the western beach, has been traced as a main nesting beach of *L. olivacea*, where a total of 154 females emerged to nest. The whole beach area is boulder-free, as can be seen at the time of low tide of spring tide (ST). There are high sand dunes of 2-3 m, starting from the north and continuing up two-thirds of the beach.

The small islands didn't show any nesting records, but the islanders said turtles usually nested on the small islands in considerable numbers. However, it is not wise to rely on these reports as these islands are not visited regularly and crawl imprints could be obliterated. Besides, the beaches of those islands have the same or better characteristics of the nesting beaches than other parts of the island, providing higher slope and sandy groves above the water line of the spring tide. The most significant feature is that the land is almost disturbance-free from the Monitor lizard (*Varanus salvator*).

Notwithstanding the nesting records, we also recorded two dead Hawksbill juveniles on the northwest beach that washed ashore on 15th November 96, and on the east beach on 21st December 97, and one adult Leatherback on April 11 (carapace length - 138 cm, length - 170 cms (head to tail), on the main Ridley beach that had washed ashore during a storm. This was the first physical record of *Dermochelys coriacea* in Bangladesh. The sex could not be determined as it was badly decomposed. The specimen had clear marks of being run over by a trawler.

The north and northeast beaches of the main island include two nesting spots which are too close to the local fish market. The whole beach habitat is subject to human disturbance and affected by fence construction for drying fish. The turtles are also vulnerable to dogs. In

1996/1997, a fisherman reported that one nest was identified when the hatchlings emerged from under the fish fence and all were taken by dogs.

The curved carapace length (CCL) for *C. mydas*, 102 cms, clutch size (CS) was 95 - 120 (\bar{X} = 108.75, n = 4), the observed nest depth was 100 cms, the egg diameter (ED), \bar{X} = 42.92 mm (n = 50); weight (EW), \bar{X} = 43.15 gms, some of the eggs were cylindrical or longitudinal while the majority were spherical. The CCL of *L. olivacea* was 67 - 75 cms (\bar{X} = 71, n = 22); CS ranged 169 - 48 (\bar{X} = 105.5, n = 132) and ED 36.86 - 39.47 mm (n = 420), EW, 25.5 - 33.5 gms.

Hatchery & Hatchlings Release: CARINAM started MTCP work with the installation of turtle hatchery, located at GPS 20°37.523' N.; 20°19.122' E. Since the turtle eggs are not safe *in situ*, the eggs have been transferred to the hatchery for safe hatching. Basically, it is a locally-made, bamboo-fenced structure located above the beach edge on a wide sandy stretch bordered by *Pandanus* and other shore vegetation. The ground is perfect for nesting.

A total 17,852 eggs were collected in November 1996 from 136 clutches (*L. olivacea*-132, *C. mydas*-4) and buried in artificial nests to await hatching. The first hatchlings emerged at night on 31 December 1996. To date, about 12,391 hatchlings have emerged and been released into the Bay of Bengal. The overall hatching rate was 84.7 %.

Since the local community was an important part of the MTCP, we released a considerable number of hatchlings in the day time (afternoon to evening), to show the community. Some of the hatchlings (50-60) were being reared in plastic bowls. This was to show the hatchlings to the tourists and local community, especially the children who have never seen turtle hatchlings because of nest predation. CARINAM personnel carefully monitored the incubation process to research the breeding biology in order to increase the successful hatching rate and expand the population of marine turtle in our territorial

water.

Local Community & Tourist Participation: The main objectives of CARINAM/MTCP was to increase the public's knowledge about the rules and regulations pertaining to turtles conservation all over the world. To increase public awareness, we visited local villages, consulted with the local communities and also with the fisherman to give a new hope for the turtle. In response, they participated with great enthusiasm. People from every part of the island visited the hatchery at least once, to watch the egg burying system and talk to the MTCP personnel.

Tourists from different districts of the country including students, businessman, servicemen, government high officials, ministers and secretaries came to visit the turtle hatchery and enjoyed the hatchlings restless swimming.

About 150 foreign tourists from Argentina, Australia, Austria, Chile, France, Germany, Japan, New Zealand, Norway, The Netherlands, Poland, the U.K., and the U.S.A., among others, participated in the night observations to see the nesting females. Some had previous experience and enjoyed releasing and carefully touching the hatchlings. Hatchling release was the most fascinating time. Approximate 8,000 hatchlings have been released in the Bay of Bengal with the participation of foreign tourists. It was a first time experience for the majority of them. All visitors highly appreciated the conservation efforts of CARINAM.

Conservation: Several causes have been recognized for the declining population of nesting turtles on St. Martin's during the last decade. These include the deterioration of nesting beaches, high predation of nests/eggs, high mortality of adults by fishing net and vessels, predation of nesting females and nests by stray dogs, and egg stealing. The major threats are: beach erosion and alteration due to man-made physical barriers around the dry beach; threats due to fishing net and fishing vessels are also not negligible.

Considering the overall threat to the

marine turtles on St. Martin's island, egg stealing from nests *in situ* is rated as the most serious problem. Under the MTCP, CARINAM transferred 17,852 eggs from 136 nests (63.25 %) to the sea turtle hatchery and another 79 nests (36.74 %) have been exploited by the local islanders. Indeed, not a single nest *in situ* is safe. Both young and old are engaged in egg searching during the nesting season.

Recommendations For Conservation Of Sea Turtles

- The main Pacific ridley nesting beach should be declared a turtle reserve immediately and fishing while the turtles are nesting should be prohibited;
- Beach conservation is essential as high sand dunes are greatly affected by heavy winds and cyclone surge; *Ipomea* plantations would be one remedy;
- The nesting spot must be rock-free; therefore, a minimum wide, rock-free stretch should be maintained to give the turtles easy access to the sandy ground, and all deep rocks must be removed;
- Fishermen should be encouraged to cut their nets to release live entangled turtles, and in return be given a subsidy to buy threads to repair the nets;
- Boulder Nets must not be set at the south, north and major western coasts;
- The stray dog population should be controlled;
- Long term research and monitoring of the nesting females should be carried out to define the actual status.

Through the ongoing conservation efforts of CARINAM/MTCP, the people's attitude has changed enough for them to at least be friendly towards the turtles. It is an extended task if we want to conserve sea turtles. This includes awareness building, education, research on population and biology, preservation of nests, nesting beaches, beach reform to expand the nesting habitat, etc. Initially, the respective authority should pay attention to saving the turtles on the island, since the government is planning to declare it a protected marine park. The foremost limitation in the laws governing

the conservation and management of marine turtles in Bangladesh is the non-inclusion of marine turtles in the protected list of animals (Schedule III) of BWPA, 1974. However, Bangladesh is committed to following the international laws of conservation and is party to several treaties and protocols in different international conventions (Islam, 1997). Recognized turtle nesting beaches must be protected: this includes the enforcement of laws regarding the beach. Currently, the only on-going research activity is the MTCP by CARINAM. The government has no conservation activities yet here on the island or on any other beach for sea turtles. Conservation efforts will fail if the local community, particularly those who are engaged in exploitation, do not benefit from the project. Therefore, inclusion of the egg collectors and sellers was our top priority. All these measures and programs need a lot of funds, at least up to the time the project becomes self-financing. Thus, an increase in the efficiency of law enforcing agencies, updating relevant laws, advocating the use of TEDs, and administrative, financial assistance to the executive NGOs is immediately needed. CARINAM is planning to set up more hatcheries on the important beaches. For the first few years the efforts must concentrate on implementation and that needs a lot of funding. The current MTCP is being carried out by CARINAM's own resources, as the MTSG funded only six months. Inadequate funding is seriously impeding the conservation effort. Without more funding the MTCP will lose its full coordination to implement effective conservation of sea turtles as well as other wildlife on St. Martin's island and in other coastal areas in Bangladesh.

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