MARINE BIODIVERSITY CONSERVATION AND MANAGEMENT

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XI. THE MARINE TURTLES AND THEIR CONSERVATION

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INTRODUCTION

Marine turtles have very long geologic history, the present day species having evolved in the early Ecocene epoch to the Pleistocene, 10 to 60 million years B.P. They are airbreathing vertebrates secondarily adapted to acquatic life. The major aquatic adaptations involve the evolution of paddle like forelimbs and high reproductive rate to compensate mortality at early life. An adult female may lay about 1000 eggs in a breeding season, out of which only 2 to 3 hatchling might reach adulthood and return to the same site to nest where they were hatched. They are reported to have a long life span, perhaps upto 100 years if allowed to life.

THE TURTLE FAUNA OF INDIA

Marine turtles are found all along the continental coasts of India and the Lakshadweep and Andaman Nicobar Islands. Five species are found to inhabit our waters all of which are capable of taking long migration. They are breeding in Lakshadweep, Andaman and Nicobar Islands and more abundantly in Gahirmatha beach along the Orissa coast. The following are the species.

Eretmochelys imbricata (Hawksbill turtle): It is a comparatively small species and numerically less abundant compared to other species occurring in Indian waters. The species is reported from Lakshadweep, Southwest coast of India and the Andaman and Nicobar waters. It mainly feeds on sponges, crabs and several molluscs. The animal may

also eat sometimes poisonous marine animals thus the flesh may be poisonous for human consumption.

Chelonia mydas (Green turtle). This is the largest species found in the Indian waters and fairly common. Occurs in the west coast and east coasts of India, Lakshadweep and Andaman and Nicobar waters. The name green turtle indicates the green colour of the fat. It is a predominantly vegetarian species feeding on the seagrass along the coast. Highly priced and very commonly fished.

Caretta caretta (Loggerhead turtle): The species is characterised by a large head in relation to the body size and has reddish brown colour. The species is hitherto recorded only from Gulf of Mannar from the Indian waters. It is a carnivore feeding on crabs, fish and other benthic organisms.

Lepidochelys olivacea (Olive ridley turtle). This is reported to be the commonest species in our waters. Very heavy concentration of this species was reported from Gahirmatha beach. On a 10 day observation about 1,50,000 individuals were observed in a stretch of 15 km that arrived for nesting. This species nests both at the west and east coast of India, as well in Island territories.

Dermochelys coriacea (The leatherback turtle): Individuals might attain a weight of upto 500 kg. A thick oily leathery tissue covers the bones of its shall hence the common name. Indiscrimate poaching of eggs have caused the disappearance of this species from the mainland coastal waters of India. However, they are seen in pristine beaches and adjacent waters of some islands in Little Andamans and Nicobar Islands.

TURTLE FISHERY AND PRESENT STATUS

Turtles were caught from Gulf of Mannar and Palk Bay from very ancient time. An estimate by the CMFRI during sixties that an average about 3000 to 4000 turtles were landed every year between Pamban and Cape Comorin. In the palk Bay the fishery was of a much lower level and about 1000 turtles were landed annually between Rameswaram and Mimisal. The main fishing centres in the Gulf of Manner were Pamban, Kilakarai, Tuticorin, Ovari, Kuttankuli,

Periathalai and CapeComorin while along the Palk Bay, the centres were Rameswaram, Tondi, Tirupallakudi, Devipatnam and Pamban. The green turtle constituted about three fourth of the total catch. Olive ridley and loggerhead formed about 20% of the catch. The catch was mainly sent to Tuticorin from different places of capture. The assembling centres for turtles in the Gulf of Mannar are Rameswaram, Kilakarai and Tuiticorin and on the Palk Bay coast Tondi and Pamban. At these places special pens were constructed in the sea close to shore for keeping the turtles alive. Turtles were caught by special type of wall nets made of fibres of *Acacia* or of cotton yarn. Two types of nets known as 'pachu valai' and 'Kattuvalai' were used each requiring between 5 to 8 men for operation. There was a regular trade of live turtles between India and Sri Lanka until recently. The meat and shell were exported for food and ornamental work. This large scale exploitation of this marine animals have resulted in their depletion in our waters and almost reached a state of endangered status. Thanks to legal measures recently adopted that this "living fossils" are getting relieved of exploitation pressure, though clandestine capture is still going on at certain places. Large scale natural mortality sometimes occurs among females during the nesting season. A study by the CMFR Institute during 1983-89 at Gahirmatha beach along the Orissa coast revealed some such instances. During 1983 a total of 7,500 carcasses of olive ridley turtles were located in a stretch of nearly 12 km. During subsequent years, the number of dead animals found along the beach varied from 392 to 694. The number of individuals that came to shore for nesting varied from 5 lakhs in 1984 and nearly 6 lakhs in 1987; 3 lakhs 25 thousand in 1989 and only 100 in 1988.

SOCIAL AND ECONOMIC VALUE

Turtle is venerated in Hindu mythology as the second of the incarnation of Lord Vishnu (*Kurma*). There was a time when fishermen used to, set free, turtles that were incidently caught in their nets. However, like any other marine organisms turtles found a place in the dinner table. The neck and tail bones are used in the preparation of soup. The fat is being utilized in soap and cosmetic industry. The shell

is used in the handicrafts and ornaments. Often juveniles and sub-adults are stuffed and sold as curios.

RECENT RESEARCHES ON TURTLES

Noting the endangered status of this valuable marine resource the CMFRI initiated detailed studies on the fishery, biology, exploitation, breeding habits and migration as well as estimation of population by late seventies (Silas, 1984). Extensive surveys were carried out along the coasts of Orissa, West Bengal and Tamil Nadu. The Andaman and Nicobar Islands were also surveyed. Data on the mass mortality of Olive ridleys on Orissa coast during the *Arribada* (massnesting) was collected. Based on the intensity of females reaching on the shore for egg laying the 12 km strech of Gahirmatha beach was demarkated as intensive, semi-intensive and sporadic zones. The olive ridley turtles were reared in the laboratory for a period of four years to study the growth rate. Some of the hatchling grew from 37 mm in carapace length to 528 mm in 47 months, and the weight from 16.3 gm to 19.5 kg. Chelonitoxication involving human fatalities was also studied. Though the exact reason for such poisoning among turtle flesh consumers is not identified, these studies have created an awareness of the problems among fishermen and medical practitioners. A recovery programme was initiated at the CMFRI Field Laboratory at Kovalam near Madras. To protect the eggs from poachers, they were collected from the nests and incubated in protected sites. A total of 51,610 hatchlings which hatched under this programme was released back into the sea, during 1978 to 1987 period.

EXISTING LAWS AND REGULATIONS

Marine turtles of our waters are included in The Wild Life (Protection) Act 1972, schedule I. They are also been incorporated in CITES. Capture of sea turtles is an offense under the existing laws.

At a workshop held in February 1984 jointly by the C.M.F.R.I., Department of Environment, Govt. of India and the Madras Crocodile Bank and Marine Biological Association of India, at Madras a number of suggestions are made for effective conservation and management of sea turtles (Rajagopalan, 1984).

They are habitat Preservation of the present critical areas, already identified vulnerable areas, new areas and the national sea shore system; species preservation through recovery programmes, translocation of nests and setting up of hatcheries; legislation and enforcement of prevelent laws and regulations and future requirements; research pertaining to biology, ecology, reporductive physiology and endocrinology; behaviour and education, training and extension especially among public and children on the importance of turtles and need for their conservation and of the supervisory personnel.

Habitat preservation

Elevation of the Bhitarkanika Sanctuary in Orissa to the status of a National Park.

Extension of the Konark Sanctuary on the sea face by 10 km north to include the sand pit at the Devi River mouth which is another mass nesting beach for the olive ridley.

Evaluation of the Point Calimere Sanctuary for its extension on the seaward side and ways and means of conservation of turtle resource in the region.

Evaluation of the status of Bhaidar Island near Okha, Gujarat as a nesting site of the green turtle *Chelonia mydas*.

Establishment of the Gulf of Mannar National Marine Park. Protection from human and non-human interferences in Andaman and Lakshadweep.

Development of a National sea shore system/ and integrated system of coastal zone management including social forestry programme and exclusive reservation of certain segments of beaches for turtle nesting.

Species preservation

Standard technologies be developed for collection of data relating to turtle nests, nesting season, clutch size, transportation of eggs, transplanting, incubation and emergence of hatchings and release of young turtles. Detailed data be collected on recovery/rehabilitation

programme on the four most threatened species in the region, the hawks bill, the loggerhead, the green and leathery turtle for different regions of the coasts with a view to improving the resource.

Attractive incentives be provided for the services rendered in egg collection for the recovery programme and species preservation.

Legislation and enforcement

A Critical appraisal of the existing legislations relevant to conservation and management of sea turtles resource is made and interpretations of CITES article III (5) is reviewed for regulating capture of sea turtles from the EEZ of the country or their introduction through the EEZ. Effective co-ordination be developed between the Forest and Wildlife Department with the Fisheries Department of the maritime states. The sea patrol is effectively activated and surveillance strengthened for strict enforcement of the Acts and Legislations. Suitable regulations be formulated to arm the Executive Officers with appropriate powers to confiscate powered, non-powered and any other vessels or vehicles used or engaged in poaching, illegal exploitation or transportation of sea turtles. Appropriate legislations be formulated to prohibit use of mechanical or manual means, tools or any destructive instruments to kill sea turtles from the EEZ of the country.

Research

Directed research be undertaken of sea turtles. A planned survey be launched along the Indian coast to identify nesting beaches. Investigations on beach erosion and accretions particularly at the important nesting beaches be intensified. The unique phenomenon of congregation of world's largest population of sea turtles at the Gahirmatha and adjacent regions be immediately studied.

Turtle hatchery programmes be encouraged with adequate financial support. Trials with turtle excluder device in trawl nets may be initiated and the gear modified to suit Indian waters. For future conservation practices it is necessary to explore options of sustained exploitations. A co-ordinated and centralised mark recovery programme for sea turtles may be initiated. A centralised data bank to facilitate

Green turtle, *Chelonia mydas*

Olive ridley turtle *Lepidochelys olivacea* returning after mass nesting at Gahirmatha beach, Orissa

Olive ridley hatchery at Kovalam, Madras

Release of Olive ridley hatchlings into sea

collection, collation and dissemination of information is needed. Research committee for sea turtles in India may be established by the Department of Environment, Government of India. A co-ordination committee be established for the maritime states to facilitate formulation of co-ordinated action plan and its implementation for the conservation and management of the sea turtle resources.

Education, Training and Extension

Concerted efforts be made on mass education of the public, fisherman and school children. Organised training courses be offered to field officers and extension officers who are involved with sea turtle conservation programme. Extension programmes relating to turtle conservation be strengthened and intensified.