

## Significance and achievements of the Indian Crocodile Conservation Project

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THE INDIAN CROCODILE Conservation Project is considered among the more successful of conservation initiatives in the world. It has pulled back the once threatened crocodilians from the brink of extinction and place them on a good path of recovery. The Project has not just produced a large number of crocodiles, but has contributed towards conservation in a number of related fields as well. It is time to highlight these other contributions and redraw attention of all concerned toward a new phase of management, keeping crocodiles as the 'flagship species'.

### *Management objectives*

The broad objectives of activities under crocodile project were as follows :

- a) To protect the remaining population of crocodilians in their natural habitat by creating sanctuaries.
- b) To rebuild natural population quickly through 'grow and release' or 'rear and release' technique involving the following phases of operation :

- (i) collection of eggs from natural nests as soon as these were laid,
- (ii) incubation of these eggs under ideal temperature and humidity maintained in artificial hatcheries,
- (iii) hatching and rearing the young crocodilians in ideal captive - husbandry conditions,
- (iv) marking and releasing young crocodiles in protected areas, and
- (v) assessing the result of release along with protection of the released crocodiles.

- c) To promote captive breeding,
- d) To take-up research to improve management. Some of the major research activities have been in the following directions.
  - (i) Interpretation of various types of data collected during survey and census.
  - (ii) Determination of parameters for maximum success in egg collection, egg incubation, hatching, rearing and release, including husbandry aspects on feeding, food conversion and growth.

- (iii) Study of habitat features and population structure.
  - (iv) Study of behavioural biology including reproduction, thermo-regulation, feeding, water-orientation, locomotion etc.
- e) To build up a level of trained personnel for better continuity of the project through trainings imparted at project-sites and through the (erstwhile) Central Crocodile Breeding and Management Training Institute, Hyderabad.
- f) To involve the local people in the project intimately through,
- (i) The development of a strong level of acceptance of the project by the people, by locating the projects in rural areas where people could both see and participate in the entire programme.
  - (ii) Protecting the immediate and long-term interests of fishermen who live within the sanctuaries, and whose livelihood depends on fishing, through, if necessary, providing an alternative source of income that are not detrimental to the conservation aims.
  - (iii) Extending the conservation programme to village-level, commercial crocodile farming, so that people can earn an income from conserving crocodiles and their habitats.
1. The thousands of crocodiles that could be seen in over thirty rearing stations, or over forty sites and zoos where captive breeding takes place,
  2. The increased sightings of crocodiles in several out of twenty natural waterbodies where more than seven thousand crocodiles have been restocked - about 4000 gharial (*Gavialis gangeticus*), 1800 mugger (*Crocodylus palustris*) and 1500 salt-water crocodiles (*Crocodylus porosus*).
  3. Subsequent natural breeding at some of the restocked locations.

The Crocodile Conservation Project has been among the most successful conservation initiatives taken in the country. In 1984, I had the opportunity of leading a three-member delegation to represent India at the seventh Working Meeting of the IUCN/SSC Crocodile Specialist Group held at Caracas, Venezuela. We presented papers on the "Status of wild crocodilians" and "Ten years review of management". During the discussion hour Prof. Harry Messel from Australia, later the Chairman of the Crocodile Specialist Group, called for over 200 participants to offer a standing ovation to the success of the Indian crocodile conservation project.

The success of the Crocodile Conservation Project is normally viewed in terms of:

In fact, the United Nations Development Programme and the Food and Agriculture

individuals on wildlife and sanctuary management with special reference to crocodilians and riverine sanctuaries. This was carried out through the erstwhile Central Crocodile Breeding and Management Training Institute), Hyderabad, which was later renamed the Crocodile Research Centre of Wildlife Institute of India.

- f) Involvement of local villagers and other public in the activities of the project. This covered individuals like boatmen, crocodile guards, nest-searchers, feed suppliers, husbandry assistants and other technical assistants.
- g) Consultancies and development of wildlife-based relationship with other countries., e.g.
  - (a) Arrangements with Nepal for collection eggs of gharial, demonstration of the maintenance of hatchery and translocation procedure for live hatchlings from Nepal to India.,
  - (b) Assessment for initiation of a project for conservation of gharial in Bhutan.
  - (c) Attending to requests from Pakistan and USA for young gharials.
  - (d) Interactions with Bangladesh for the management of crocodilians there.
  - (e) Training to individuals from Nepal, Sri Lanka and Iran in crocodilian management.
  - (f) Procurement of a male

gharial from the Frankfurt zoo for successful captive breeding at Nandankanan.

*Management of terrestrial habitat*

The Crocodile Conservation Project has seen the creation of first few wetland sanctuaries of the country under the provision of the Wildlife (Protection) Act, 1972. These crocodile sanctuaries encompass 8,00,000 ha besides the other areas protecting crocodiles covering over 12,00,000 ha. Thus, the total area covered under protected area network for crocodile management is 20,00,000 ha. At the beginning of 1980s, the project boasted thirteen crocodile sanctuaries. Later, several other protected areas highlighted their attention to the management of crocodilians. e.g. Corbett National Park, Dudhwa National Park and Simlipal Sanctuary and National Park, all of which are tiger reserves covered under Project Tiger.

Out of the initial list of crocodile sanctuaries, the Nagarjuna Sagar Srisailam Sanctuary (Andhra Pradesh) was later declared a tiger reserve, and the Satkoshia Gorge Sanctuary (Orissa) has been nominated for declaration as either the second tiger reserve or an elephant sanctuary. Satkoshia Gorge Sanctuary and Bhitarkanika Sanctuary have also been proposed for declaration as Biosphere Reserves.

*Wildlife research*

One of the most striking features of the Crocodile Conservation

Project has been the building up of a base for wildlife research in the country - beginning with the state of Orissa, and followed by Uttar Pradesh and Andhra Pradesh. The project started a trend of involving fulltime research personnel, propagating the idea that successful conservation and research must go hand in hand. Since those initial years of experimentation, the research trends today have certainly gained more significance, yet the research cadre in wildlife conservation projects in the field today survive only in Orissa. In fact, the base for wildlife research is a blind offshoot of the cadred Forest Department. The Government of India has now created a Group 'A' Scientific Service in the Department of Environment, Forests and Wildlife but it does not include any of the fulltime wildlife researchers who began with the Crocodile Conservation Project.

#### *Multiple species management*

During the course of field research in wildlife sanctuaries, particularly the Bhitarkanika Wildlife Sanctuary, Satkosha Gorge Sanctuary and the National Chambal Sanctuary, the ecological roles of other wetland fauna could be highlighted and today we talk of the projects on freshwater turtle, otter, monitor lizard, river dolphin and even the sea turtle.

After the Crocodile Conservation Project took off in Orissa, it was because of surveys along the Bhitarkanika coast and discussions with the Maharaja of Kanika and

Forest Department officials, the turtle resource of the Gahirmatha coast could be highlighted, and later help was even sought to arrange protection to Gahirmatha by the Indian Navy. Today, Gahirmatha is known to be the largest rookery of sea turtles. In view of this Orissa had produced a project document for an integrated scheme on conservation of the saltwater crocodile and the marine turtle in Bhitarkanika.

#### *Project Tiger compared*

The Crocodile Conservation Project compares well with the universally acclaimed Project Tiger. Project Tiger involves protection of the sites of conservation and takes an *in situ* approach, while the project on crocodiles involves both *in situ* and *ex situ* approaches, offering protection to habitat in its totality and also *ex situ* management of the eggs and animals to produce a large number of the animals and improve their chances of survival.

If it is argued that the latter approach was also to demonstrate the 'farming' potentialities of crocodiles, that too again is well ahead of time into which India will step-in in near future. As the trend goes, "human elements" cannot be kept off the wilderness areas and as such, the "use-component" cannot be totally checked. In such a case, crocodiles will stand in the fore-front of sustainable yield programmes of wildlife resource management, whenever the concept is legalised.

*The future*

As said earlier, crocodile conservation is a highly successful story in terms of setting a trend in wetland faunal management, wildlife research and training. Today, the population of all Indian crocodilians along with their ecological associates continue to survive in a relatively healthier state. But the urgent need is to reassess their status in the wild and draw up an action plan that can maintain the effort and momentum of the project and sustain it over a long period of time ahead.

Accordingly the project today needs to -

- (a) immediately conduct an extensive survey in all crocodile habitats;
- (b) keep alive some good rearing stations;
- (c) locate alternative habitats for gharial;
- (d) attend to 'problem crocodile' calls more effectively;
- (e) build up a base to gear villagers towards a possible village farming operation for the saltwater crocodiles; and
- (f) project crocodile sanctuaries as wetland areas of multiple-species management.