

Public Involvement in the Indian Crocodile Conservation Programme

Lala A. K. Singh¹

BETWEEN 1971 and 1974, when programmes for conserving the crocodilians of India were being planned, it was recognised that public involvement would be an important factor contributing to their success or failure. In this chapter, I briefly describe the way in which the public has become involved in the programmes and the use to which the crocodile management programmes have been put in the economic and long-term development of environmental awareness among the people of India, especially those living in "crocodile" areas. Uniform opinion has developed that money spent from the Government Exchequer for conservation programmes is ultimately channelled back to the public, with an intermediate or by-product achievement of the conservation goal.

India and her people in the early 1900's were different from those in the immediate pre-independence era, and different from those today, in 1985. Exogenous influences on the culture of rural people have altered their views on the utilization of various natural resources. The people are now very much aware of the potential avenues for earning money through selling the skin of a tiger, panther or crocodile, or by selling several pieces of costly timber. This situation exists despite the fact that most Indians are god-fearing and orthodox. Up until the 1970's, crocodile worship was known from various parts of the country and even today there are a good number of people who venerate crocodiles as mounts (vehicles) of the Goddesses Ganga and Khodiyal and the God Varuna. Changes in attitudes have occurred because of ever-increasing demands and competition within a gigantic, developing, democratic nation with a continually expanding population.

Following on from the first meeting of the Crocodile Specialist Group of the International Union of Conservation of Nature and Natural Resources (IUCN), in 1971, the Government of India took steps to commence a crocodilian management programme. In 1974, the Food and Agriculture Organisation (FAO) of the United Nations extended

to India expertise for survey work, at a time when crocodilian populations had already been greatly depleted and when most remaining crocodilian habitats were being encroached upon.

During this period, unless influenced by hide-hunters, the local villagers were somewhat indifferent towards wild crocodilians, but businessmen and Departments with fisheries interests were hostile towards them. There were reports of poachers visiting the remaining habitats and some tribal people were known to collect crocodile eggs for food. Most of the habitats were under very heavy pressure due to agriculture, fire-wood collection, cattle grazing and grass cutting, and others were in water courses that were used extensively for river traffic. This was the adverse situation under which the crocodile conservation programme was launched.

The immediate priorities were to reduce the numbers of animals being killed in the wild by natural causes and to grow a large number of crocodiles in captivity for restocking. The main thrust of the FAO/UNDP programme was to collect eggs from the wild, incubate them in captivity, raise the hatchlings in captivity until they were beyond a size that predation could be considered a serious threat, and then release them back into natural waters. By 1985, at least 34 rearing stations, including one private institution, the Madras Snake Park and Crocodile Bank, had been established in the country. In addition, 34 different protected areas provide the wild crocodilians with habitats in which they can live. Of these, 13 sanctuaries were created specifically for crocodilians, and they encompass some 8200 km² out of a total area where crocodiles are protected of over 20,000 km².

Before implementing the crocodilian conservation programme, the following concepts were embodied within the proposed framework:

1. 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.

¹Government of India, Crocodile Research Centre, Camp National Chambal Sanctuary, P.O. Box 11 Morena 476001, Madhya Pradesh, India.
Pages 233-37 in *WILDLIFE MANAGEMENT: CROCODILES AND ALLIGATORS* ed by Grahame J. W. Webb, S. Charlic Manolis and Peter J. Whitehead. Surrey Beatty and Sons Pty Limited in association with the Conservation Commission of the Northern Territory.



Fig. 1. Captive *Crocodylus palustris* at the Madras Snake Park and Crocodile Bank.

2. Protect the immediate and long-term interests of fishermen who reside within the sanctuaries, and whose livelihood depends on fishing, by, if necessary, providing an alternative source of income that was not detrimental to the conservation aims.
3. Extend the conservation programme to village level, commercial crocodile farming, such that people could earn an income from conserving crocodiles and their habitats.

PROJECT LOCATIONS AND BENEFITS TO THE PUBLIC

When deciding on the location of rearing centres, there were essentially two options available. They could have been located in the cities, where amenities were available and where the rearing of crocodilians would have been easier; the raised animals could then be transported for release into the sanctuaries being rehabilitated. The second option, was to locate them in the remote areas, cope with the limited facilities for raising, but rear and release the crocodiles so that the local, rural people could witness and participate directly in the entire programme. Since the second option included the involvement of local rural people, most of the 34 rearing stations were located in rural areas.

The most direct benefit that has accrued to the public from this strategic location is employment

opportunities. A variety of husbandry assistants, food suppliers and casual labours with various skills are needed for the upkeep of each rearing station. Several people have also received employment as "crocodile guards" in the sanctuaries.

With regard to crocodile guards, there is an interesting case history from the Satkosha Gorge Sanctuary, Orissa and the adjoining Mahanadi River. Early in 1976 we were carrying out a survey in Mahanadi to locate remnant gharial (*Gavialis gangeticus*) and mugger (*Crocodylus palustris*) populations, and we came across a few people who were assisting crocodile skin poachers. The poachers, mostly from the neighbouring States, used to visit the remnant populations during the winter and employed the villagers to help them locate the crocodilians along the river. Depending on the nature and extent of assistance, the villagers were receiving about Rs.50/- (Aus\$5.00) per year. The tribal people were skinning the crocodiles and used to get the meat — the poachers took the skins.

Our approach to this situation was a pragmatic one. Firstly, we made the villagers aware that they *were* involved in an illegal activity, and that as a consequence, they could be put behind bars at any time. However, illegal as the activity may have been, it was providing a maximum of only fifty rupees a year. Secondly, we offered the people jobs with the Government, and they became gharial guards, patrolling a specific stretch of the Mahanadi River. Originally these people had been fishermen leading a relatively hard life. Today they wear a *khaki* uniform and enjoy a special status in their locality. The poachers have ultimately given up their activities.

Several indirect benefits have reached the people, through the development of the project locations as places of interest to tourists. Satkosha Gorge Sanctuary, which is situated in the scenic Mahanadi River area, affords a good example. When a tourist bus reaches Tikerpada village, the local shops are suddenly crowded with up to 100 people. This provides much greater potential for selling goods and even 100 cups of tea in an hour is significant to a shopkeeper. Such places had some tourist throughflow prior to the crocodile projects, but this has definitely increased significantly since they started. Tourists hire local village boatmen to take them to the other bank of the river, or even a couple of miles along the river course, where they can experience the adventure of the journey and view the wildlife. In one hour, a village boatman can earn more than half of his entire income for an ordinary month! Some village boys take visitors on guided walks through the forest, and tribal people can sell produce such as honey, or even a simple piece of driftwood; they receive some money to purchase their daily needs.



Fig. 2. The crocodilian conservation project in India has created much needed employment opportunities in rural areas.

However, after years of living in various crocodile sanctuaries and associating closely with rural people through the conservation programme, one must admit frankly that there is not unanimous acknowledgement of the direct and indirect benefits accrued to the public through the crocodile conservation projects. As a consequence, a more direct programme for educating the public about crocodiles is being pursued.

At present, public education can be considered under two broad headings. Firstly, at the various project locations, the public are educated during guided tours of the project facilities. Secondly, there are training courses conducted for management personnel. In 1978 the Central Crocodile Breeding and Management Training Institute was established in Hyderabad to train managers in all aspects of crocodile and sanctuary management. The services of most of these trained managers are being utilized in various crocodile and other wildlife sanctuaries. At present the training programme is being carried out under the auspices of the Wildlife Institute of India, located in Dehra Dun, which again is a project running with FAO/UNDP assistance and collaboration.

Public education about crocodilians is also pursued by non-government agencies like the Bombay Natural History Society, the Madras Snake Park and Crocodile Bank, and the World Wildlife Fund-India. These agencies have extended to the people of cities and villages a sense of awareness about the need for conservation programmes.

About five years ago, I had reason to reflect on an accusation that animals were being protected in India by "affluent city dwellers who enjoyed the thrill of seeing them when on holidays". Although there is an implied selfishness in such a statement, which was a little disturbing, I can see no wrong in this direction. In fact such people should be encouraged to continue, because they are in a better

position to do so, and can possibly achieve their aims more effectively. It does not matter if the city dwellers enjoy the scene when on holidays. In furtherance of their pleasure, we can witness a twofold by-product: animals are saved from becoming extinct, and villagers are educated and benefit in various other ways.

PUBLIC SENTIMENT

With the increase of human populations, contact and competition with crocodilians in all habitats have become more prominent. Yet the fishermen who set out in the morning still consider the sighting of a gharial as a good omen. "Fear" of crocodiles exists mostly in city dwellers. People residing beside sanctuaries, like the National Chambal Sanctuary, do not consider the gharial to be an animal which conflicts with local interests. On the other hand, the mugger does have a bad reputation for occasionally attacking goats or village dogs. In the sanctuaries for saltwater crocodiles (*Crocodylus porosus*), there are occasional reports of human fatalities. However, when these are analysed, each reflects negligence or a lack of precautionary measures when in areas known to contain crocodiles.

It was under this curious mixture of love-hate attitudes by the public towards crocodilians, that we initiated the restocking programme, although localities chosen for restocking were relatively free from human activities. The movement patterns of released animals were studied and in some cases actions to extend sanctuary boundaries are now underway as a consequence. Where restocked juveniles stray into a village pond or too near to a centre of human habitation, they are caught and transferred to a new release point or back to a rearing station. In some areas protected bathing zones for people have been delineated, and in the State of Andhra Pradesh, the public relations activities associated with restocking went to the extent of helping the people to resurrect an old place of worship and to mark out a bathing zone.

Unfortunately, there always appears to be some people who are prepared to exploit any situation for personal gain, and the crocodile conservation programme has been no exception. An interesting case history comes from the restocking programme for muggers. In the State of Tamil Nadu, raised muggers were released back into the wild, and soon after a complaint was received from a fish farmer. Apparently one of the restocked muggers had entered his farm and during a period of about 2 months he was claiming that it had eaten or damaged some Rs.20,000/- (Aus\$2000) worth of stock! The person was taken to one of the rearing stations and shown the quantity of food a mugger eats in a day. Soon afterwards he went to the office where he had lodged his complaint and withdrew it, without further reason.

Compensations given under "Project Tiger" for livestock killed by tigers occasionally results in fabricated cases, just as occurs within the crocodile project. For example, the claim that a five foot long gharial "pulled down a buffalo"!

PROTECTION OF LOCAL INTERESTS

The long- and short-term interests of people who were earning their livelihoods in and around sanctuaries were given considerable consideration when the programme was initiated. In the early phases of the project three aspects were of immediate concern: the eating of crocodile eggs by tribal people; the use of nylon set-nets within sanctuaries; and, in some sanctuaries, the extent of fire-wood collection which was reaching alarming proportions and threatening some adjacent forests.

1. Egg Eating

A number of different groups of tribal people were in the habit of eating crocodile eggs, particularly the *Kandba* and *Munda* tribals of Orissa and the adjoining States, and the *Irulas* of Tamil Nadu. In Nepal too, the *Tharu* tribals ate gharial eggs. When the Government's egg collection programme commenced, concerned tribals were incorporated into the projects as assistants in both the field and rearing stations. Those who had traditionally mastered the art of locating nests were used for that purpose. They were required to inform the appropriate management authorities when they found a nest, so that trained personnel could carefully excavate it and collect the eggs. People locating nests received Rs.5/- per egg. In some instances knowledgeable tribal people are employed on daily wages for a few months at a time to both locate and protect nests. The new "earning" capacity of the eggs has changed attitudes, as the people can purchase much more food with the money earned from eggs than was supplied by the eggs themselves.

2. Fishing Nets

During 1950's the Fisheries Department introduced nylon set-nets to increase the fish catch. Fishermen using those nets claim that during the first five to six years their catches of fish were so high, that they were often unable to process and/or market the complete harvest — there was indeed a heavy waste of the resource at that time. In subsequent years, the catch dropped precipitously, and in many instances, earning a good daily living from fishing became difficult. The nets had contributed substantially to a decline in the fish resource, and consequently had affected the entire ecosystem. There was yet another severe consequence of nylon set-nets — crocodile populations declined to a level approaching extinction. They became entangled in the nets and either drowned or were beaten to death by the fishermen.

Within the beginning of the crocodile conservation project, nylon set-netting was banned in all sanctuaries (since 1975), and traditional fishing methods were reintroduced. These include the use of floating baits, and to a lesser extent throw nets and drag nets. This change has been beneficial to both the fish and crocodile stocks, as can be exemplified by the situation in the Satkoshia Gorge Sanctuary. After ten years of control over fishing methods in a 32 km stretch of river, the fish population has increased noticeably. Even by using the traditional method of floating baits, the daily catch for the 32 km averages 300-400 kg during the peak season. This is an extremely high catch, and steps are now being taken to ensure that the harvest proceeds without interference from outside fishermen. It rightfully belongs to the 15 to 16 permanent families of fishermen that reside beside the river bank in the sanctuary. Permits have been issued to these people at the very low fee of 25 paise (Aus\$0.25) per floating bait. These permits are renewed every month so that we have a check on the conduct of the fishermen.

However, before these actions were implemented, the nylon nets in which people had invested (between Aus\$100 and Aus\$1000) needed to be purchased back. Under a buy-back scheme, a list of fishermen was prepared, with information on the number and value of their nets, and then the nets were purchased by the Department. Some fishermen readily offered their nets for sale, but others continued to use them stealthily, only to be caught under the law prohibiting their use. Today, people have come to realize the long-term significance of these management regulations. It takes time for such initiatives to be accepted, especially in a developing, democratic nation such as India, where for many rural people, even a minor set-back in earning capacity is significant.

3. Fire-Wood

To reduce pressure on the mangroves caused by the collection of fire-wood, in one of the sanctuaries (Bhitarkanika Sanctuary), subsidized fire-wood was supplied to the people by the Government. More recently, most State Governments have taken steps to promote the use of solar cookers in place of fire-wood.

EXTENSION PROGRAMMES TO VILLAGE LEVEL CROCODILE FARMS

Within the original project document, completion of the intensive conservation phase was to be followed by a programme which extended crocodile farming to the village level as a commercial enterprise, and which allowed villagers to participate in it. The inspiration for the concept came largely from the programme in Papua New

Guinea. This aspect of the total management project for crocodilians within India is yet to be fully implemented, because under the existing Schedule I status of Indian crocodilians within the *Wildlife (Protection) Act, 1972*, commercial utilization of crocodilians is prohibited.

However, the groundwork for the implementation of a farming programme is being carried out. In 1974 we were not in a position to pursue commercial farming, because it may well have had an adverse effect on the depleted wild populations. Instead, we vigorously pursued a large-scale conservation programme and commercial farming was relegated to the "future".

Within India, there is a high level policy-making body, the Indian Board for Wildlife, whose Chairman is the Prime Minister of the country. In 1982, when the late Prime Minister, Mrs Indira Gandhi was the chairperson, the board agreed that no farming would take place as yet, and there would be no change in the status of the Indian crocodilians under the law. Yet, on an experimental basis, farming could be researched and a project is planned in Tamil Nadu, the largest mugger State. The basic

technologies for farming have been developed during the last 10 years through the 'grow and release' operation. These include pen-design, basic husbandry requirements, food preferences, food intake and conversion rates, etc. When the experimental stage of the pilot "closed-circuit" farming project is over, we hope to be able to extend the concept to the villagers.

The experiences with the conservation and management of crocodilians in India have now been extended to other aquatic fauna. For example, studies are now underway on turtles, with a view to both conservation and utilization on a sustained yield basis.

ACKNOWLEDGEMENTS

I wish to thank the Australian Council of Nature Conservation Ministers who sent an invitation for a representative of the Government of India to attend the conference on crocodile management held in Darwin, and the Conservation Commission of the Northern Territory who so generously provided fares and accommodation.