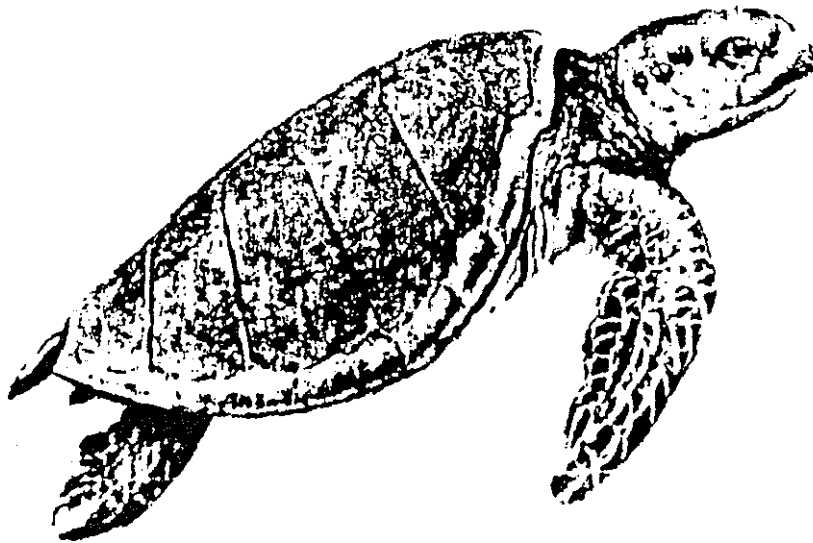


RPT

To Mr. B. C. Choudhary
With Compliments
CEB RPT 4972
PRE

**STATUS, ECOLOGY AND MANAGEMENT OF
OLIVE RIDLEY SEA TURTLES AND THEIR
NESTING HABITATS ALONG NORTH COASTAL
ANDHRA PRADESH**



**A WWF-INDIA, CONSERVATION CORPS VOLUNTEER
ANNUAL REPORT (JAN 1997 TO JUN 1998)**

**Prepared By - K.V.R. PRIYADARSHINI
CCV, WWF-INDIA**

INTRODUCTION

Turtles have been known to Nest on the Indian Coast since ancient times and the East Coast of India especially gains importance because of the unique phenomenon of 'Mass Nesting', the *Arribada* of the *Olive Ridley* (*Lepidochelys olivacea*) brought to notice by Mr.H.R.Bustard of the Food and Agricultural Organisation. The *Arribada* is a unique social behaviour not reported in any other species of Marine turtle and is unique to the *Olive Ridley* Marine turtle species.

In the last 2-3 seasons, the turtle mortality, due to various reasons has alarmingly risen. The Nesting at the largest *Arribada* site was also unsuccessful with the numbers of Nesting turtles visiting the site having decreased phenomenally (personal communication, Mr.Bivash Pandav, Wildlife Institute of India).

The trend has not only been observed on the Orissa Coast, but also in the presernt study Area of North Coastal Andhra Pradesh, covering 4 districts:-

- (1) Srikakulam
- (2) Vizianagaram
- (3) Visakhapatnam
- (4) East Godavari

In the absence of any detailed study or conservation program of the Sea Turtles coming to Nest on North Coastal stretch of Andhra Pradesh and

after consulting the WWF Andhra Pradesh State Office, I decided to take up a project on "Status, Ecology and Management of *Olive Ridley* Sea turtles and their Nesting Habitats in North Coastal Andhra Pradesh". Officially I started work as a conservation Corps volunteer with WWF in January '97.

The present Study Area covering approximately a Coastal stretch of 370 km was selected due to its proximity to the *Arribada* site at *Rushikulya*. The Northern most point of the Study Area is approximately 70 km South of *Rushi Kulya*.

The Study area is also historically significant in relation to the sea turtle. "*SRIKURMAM*", an ancient temple dedicated to the "*Kurma Avatara*", the Sea Turtle incarnate of Lord Vishnu, the only one of its kind in the World, is situated in this area (Photograph 1). Historically, *Srikurmam* was an area between *Vainsadhara* and *Nagavalli* Rivers and the *Kurma-avatara* is believed to have originated from the Sea of this Area (Source - Sthalapurana of Srikurmam temple). Now, the beach is about 4-4 1/2 Kms. from the temple and like the rest of Andhra Pradesh, sporadic nesting occurs here.

THE STUDY AREA

The Study area (Map 1), as already mentioned is approximately 370 Km of Coastline and is characterised by a variety of habitats.

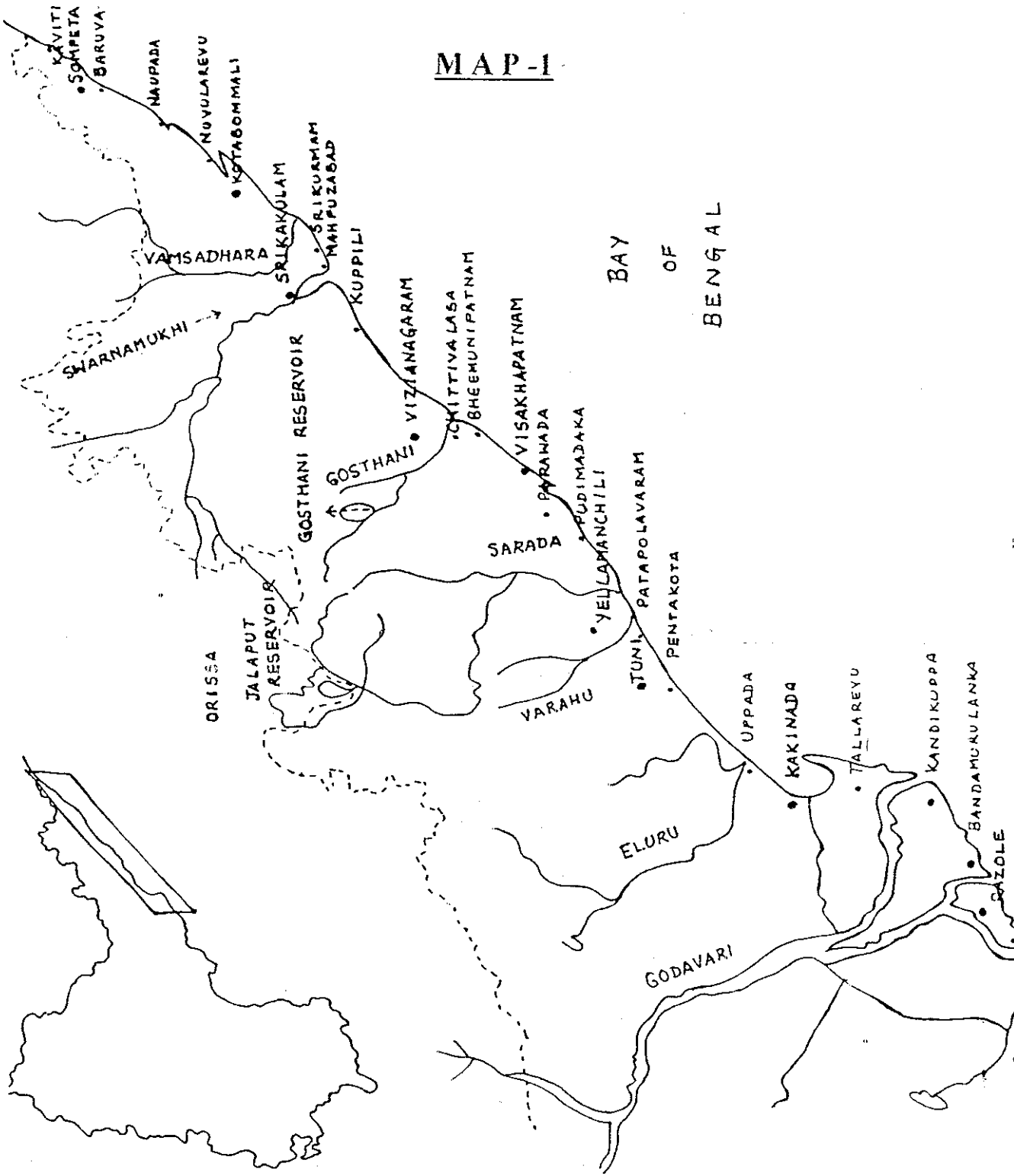
PHOTOGRAPH 1



THE GOPURAM OF THE 'SRIKURMAM' TEMPLE



MAP-1



It has a major river, the "Godavari" and 5 others small rivers joining the Bay of Bengal. It also has a good Mangrove forest, which is a part of the Godavari estuary and forms a part of the "CORINGA" sanctuary and Reserve forest (Photograph 2). This habitat supports a variety of flora and fauna, most popular of which is the Sea Otter. Quite a few species of Birds (Gulls, Caspian Tern, Pied Kingfisher, Riverine Tern, Grey Heron, Flamingo, Curlew, Egrets, Pond Heron etc) were also sighted in this Area, both migratory and others.

The Godavari Delta region is interspersed with intertidal mudflats and sand bars (Map 2) which are unique ecosystems and especially the sand bars are very conducive for the turtles to Nest.

The Fishing activity in this area is very high both by mechanised boats and small non mechanized boats, all through the year (Photographs 3 & 4). Recently, discussions about having a conservancy period when no fishing will be done were held by different Unions and Organisations of Mechanised boat operators and owners. The outcome has yet to be made public.

when to
where?

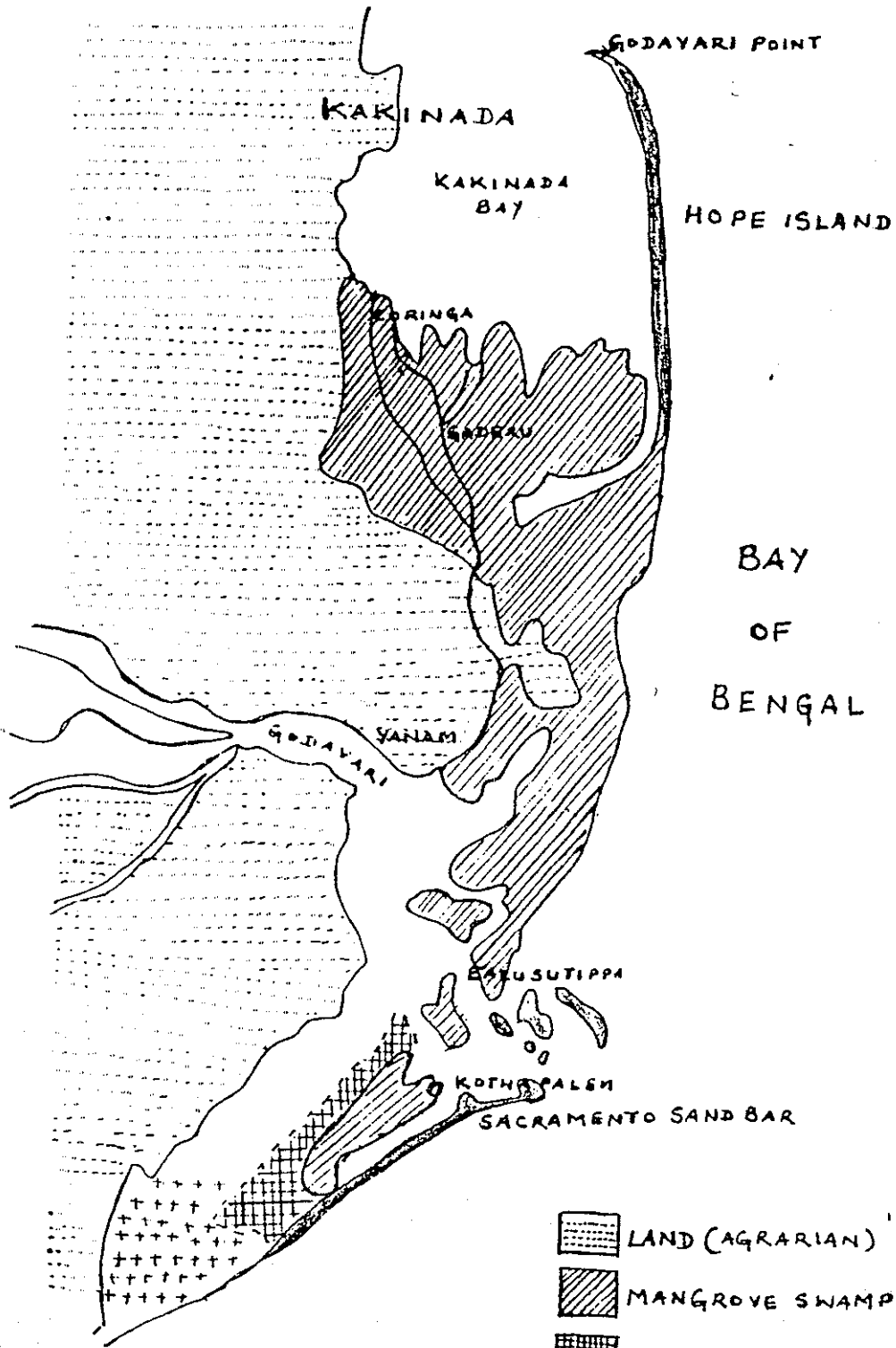
Two major ports, Visakhapatnam and Kakinada are operating in this region, which have greater expansion plans in the future. Kakinada port is already being revamped with Dutch collaboration and a new deep sea port is coming up near "Hope Island", a unique geo feature, a big elongated intertidal sand bar separating Kakinada Bay from the open sea.






PHOTOGRAPH 2



THE THICK MANGROVES AT THE CORINGA RESERVE FOREST

MAP-2



-  LAND (AGRARIAN)
-  MANGROVE SWAMP
-  MARSHLAND
-  BACKWATERS
-  SAND BARS

PHOTOGRAPH 3



MECHANISED BOATS AT THE VISAKHAPATNAM FISHING HARBOUR

PHOTOGRAPH 4



MECHANISED BOATS AT THE YETIMOGGA BOATYARD AT KAKINADA

The stretch of North Coastal Andhra Pradesh is also identified as one of the major cyclone prone areas and due to this extensive Casuarina plantations have been taken up as shelter belts by the Andhra Pradesh State Forest Department.

This region is identified as one of the important sporadic nesting regions for the *Olive Ridley* which visit the coast from late December to Mid April. During the course of the project work, it was learnt that 2 other species also visit this area and incidental catch is also reported. These are :

- (1) *Hawksbill (Eretmochelys imbricata)*
- (2) *Green turtle (Chelonia mydas)*

WORK PLAN

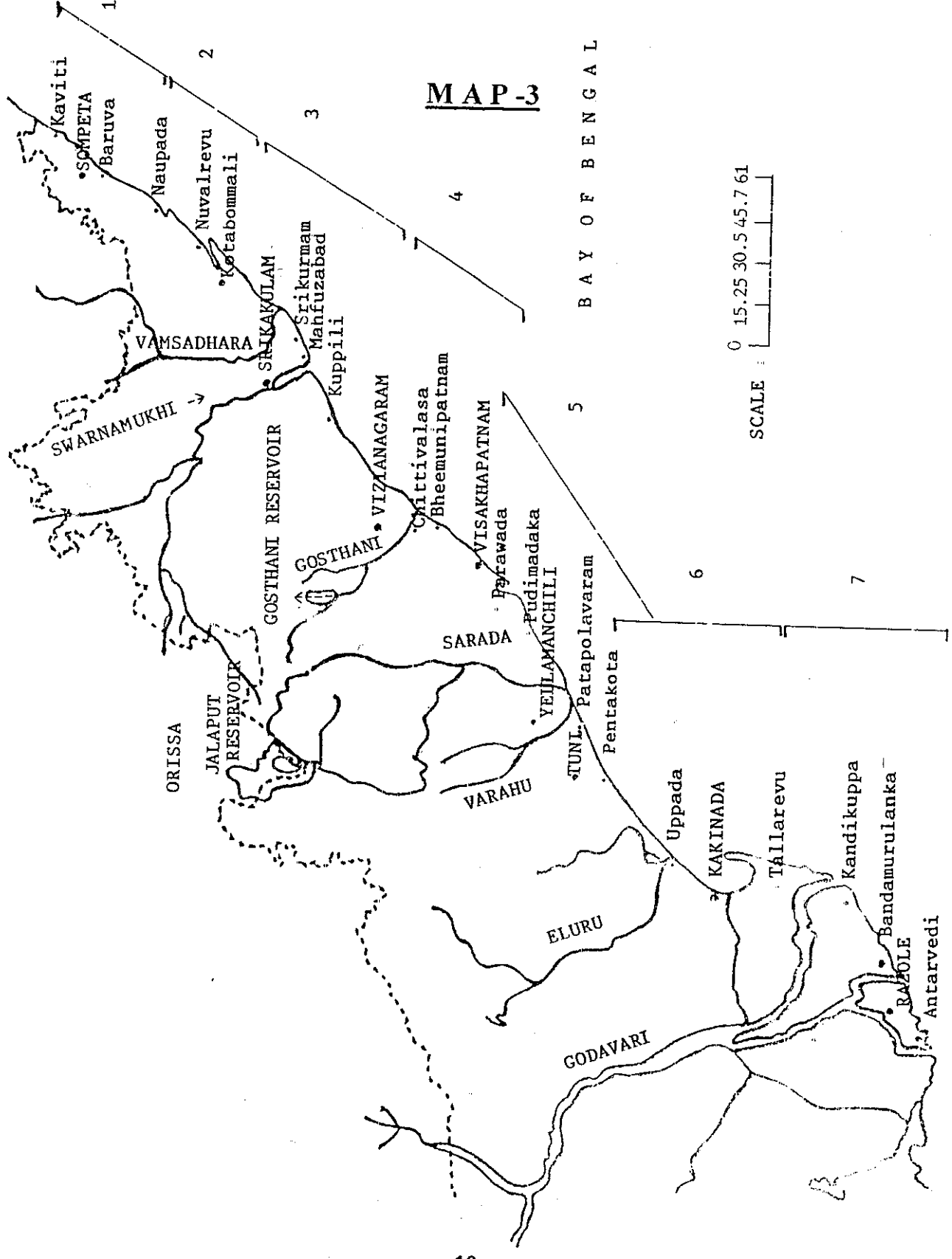
Since the actual intensity of turtle nesting and the numbers of nesting turtles visiting this area is not known, as also the study area is quite expansive, it would not be possible to monitor the entire area. Keeping this in view, the entire study area was divided into 7 convenient zones (Map 3).

Secondary information about each zone was collected by interacting with the Fishermen and their families. In each zone a minimum of 3 different clusters of villages were visited. In each zone a local Resource person was identified.

Apart from the above, a complete identification of the communities involved in fishing, their Socio Economic status, their awareness level of



MAP-3



SCALE : 0 15.25 30.5 45.7 61

BAY OF BENGAL

various aspects etc., which will be elaborated later in this report, were ascertained.

Since, eliciting information from the grassroots, in this case the Fishermen, has not been an easy task, I've been able to liaise with different Non-Governmental Organisations (wherever identified) and individuals working with Fishing communities or with an interest in conservation in quite a few places. The Andhra Pradesh State Forest Department especially has been very helpful in quite a few places.

WORK DONE

A complete preliminary survey of the entire study area comprising 4 districts and 131 fishing villages, some villages in a cluster and others situated separately.

PRELIMINARY SURVEY

The preliminary survey was done during both the Nesting and Non-nesting seasons. The nesting season comprising of January and February '97, when as compared to the '98 season, the nesting started and finished early. The preliminary survey was completed in January '98 where the complete coastal stretch of North Andhra Pradesh was covered.

The strategy used was in every 10 km stretch a single village was visited and if more than one village was present and easily accessible those villages were also visited.

Using this strategy, the complete coastal stretch was covered and detailed secondary information regarding Turtles and Turtle Nesting, Socio Economic status, Awareness levels etc. were elicited.

Initially work was quite slow and at times frustrating especially where I had to approach the fishing community directly. But at places where the Non-Governmental Organisations were working, Fishermen were very forthcoming with information.

The biggest problem in getting information from the fishermen was they couldn't give any numbers. So, the statistics if any, are approximations and need to be personally verified.

After the completion of the preliminary survey, sites were identified, again based on the secondary information only, which seemed to have high intensity nesting. These are Kopaskudd (Kaviti Mandal), the Northern most point of the study area and the "Sacramento" Bay Islands, comprising of intertidal sand bars at the mouth of the River Godavari.

Apart from the preliminary survey, a visit was made to Wild Life Institute of India in early May '97 after the review schedule work shop at Delhi, where a detailed discussion and review of the project strategy was done with Mr.B.C.Choudhary, an expert on the subject. We could also get some valuable literature hitherto not available to us. I've also been corresponding regularly with the Madras Crocodile Bank Trust and Dr.Harry Andrews was very helpful with some more literature and advise regarding Turtle conservation.

It was suggested while doing the survey that we should begin at one end of the Study Area and finish at the Southern point. This has not been possible due to infrastructural difficulties and certain very practical problems.

FINDINGS OF THE PRELIMINARY SURVEY

During the preliminary survey, we came to know that the Nesting of the *Olive Ridley* sea turtles in the North Coastal stretch of Andhra Pradesh is medium sporadic, though actual statistics were difficult to ascertain from secondary information. The Fishermen gave the number 3-4 nests on an average per season per village, except the 2 sites 'Kopaskudd' & 'Sacramento' mentioned earlier.

A) FISHING COMMUNITY & THEIR LIFE STYLE

The preliminary survey also involved interacting with Fishermen and eliciting information about their dependence on turtles for food or otherwise, existence of traditional medicine and the use of Turtle *Calipee*, the species of turtle from which it is extracted etc. It also gave me the opportunity to observe their life style, their religious beliefs, food habits and the Social structure. All these form a major objective of the project and the basis on which a conservation strategy and plan will be based.

The findings were that a typical fishing village consists of an average of 300 - 350 families (this number is more in case of bigger landing centres like *Chintapalli* or *Pudimadaka*), completely dependant on traditional fishing.

At places small machine powered fibre boats bought with loans from banks were also seen, but the numbers of these boats are few. Though the boats are powered, the fishing is traditional.

These are 3 types of craft used all over North Coastal Andhra Pradesh (Photographs 5, 6 & 7).

- (1) Teppa (Catamaran)
- (2) Nava/Padava (Ordinary boat and in 2 sizes Small Nava and Big Padava).
- (3) Fibre boats (Machine powered small boats made of fibre glass).

Trawlers are found in Visakhapatnam and Kakinada.

The Life style of the Fishermen families has undergone a sea change. Education has gained importance, but even though the community has realised the importance of literacy, the level of education is limited upto Primary school, especially for boys. This is because they feel that the child must go for fishing along with the elders to learn the skills important for his livelihood

Government of Andhra Pradesh has provided schooling facilities in almost all the fishing villages that I've visited but attendance of older children is scant. A couple of Non-Governmental Organisations are also running Non Formal Education Centres wherever they are working. But this also is limited to the younger children only i.e. upto the age of 9.

PHOTOGRAPH 5



TEPPA

PHOTOGRAPH 6



NAVA

PHOTOGRAPH 7



TRAWLER

Politically also the Community is very aware of their rights. They have Organised Unions and Fishing Community organisations which are quite active.

Increase in literacy level and education has led to migration and diversification from traditional fishing to other trades.

The type of fishing nets used now are also completely different from what were used in the past. Due to this the type of catch has also changed with some types of fish not figuring at all in the catch in the past 20 years. A few elderly fishermen said that either the fish has vanished or expressed the probability that the change in gear has resulted in the fish not being caught at all (Photograph 8).

The Fishing community of North Coastal Andhra Pradesh is not a tribal community and there exists a social hierarchy. They have a caste system and the castes are the same for 3 districts namely *Srikakulam*, *Vizianagaram* and *Visakhapatnam*, but it is different and more varied in *East Godavari*.

In the former 3 districts basically 2 castes are seen :

- (1) Vodabaliyas
- (2) Jalaris

Vodabaliya group occupies the higher social hierarchial position. Apart from these 2 major castes which depend on deep sea traditional

PHOTOGRAPH 8



THE CATCH JUST BROUGHT IN BY THE FISHERMEN

fishing, there is also the less numerous and less distributed *Palli* group, found only in certain pockets along the Coast. This group occupies the lowest rung of the social ladder. This group is a land based fishing group involved in prawn seed collection in small rivulets joining the Bay of Bengal and does not participate in deep sea fishing.

In East Godavari, an additional caste, more dominant than the Vodabalijas, we find the "*Agnikulakshatriyas*" in addition to Vodabalija, Jalari and Palli groups. The *Agnikulakshatriyas* form the highest rung in the social ladder in the East Godavari district. These people are highly religious and are known for their reverence of the sea turtle which they worship as a form of Lord Vishnu.

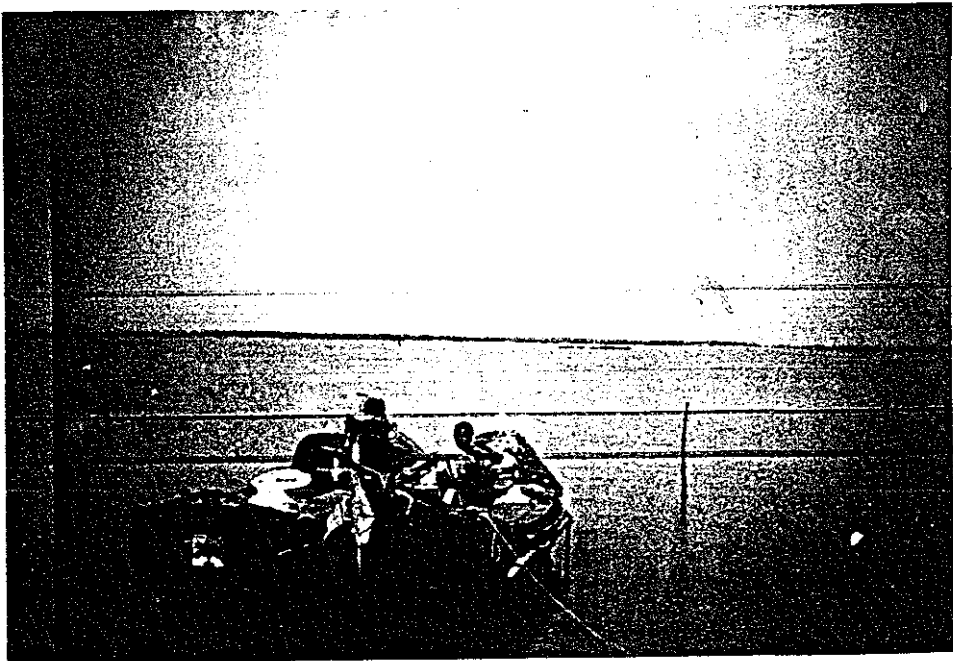
The Women of the Community play a major role (Photographs 9 & 10). The Fisherman's job is only to bring in the catch but the entire marketing is looked after by the Women. Women of the Fishing community are also very aware in terms of education and finance. During my visit to Vizianagaram and Tuni stretch of Visakhapatnam coast, where Non-Governmental Organisations by the name of *Association for Rural Development and Action Research (ARDAR)* and *Bhagavatula Charitable Trust (BCT)* respectively are functioning, I was told that the thrift and credit schemes and education centres are being run successfully only due to the active role being played by the Women volunteers. Even where Environmental issues and conservation status of animals, in particular sea turtles were brought up, they were keen and very prompt in saying that the numbers have drastically reduced in the last few years.

PHOTOGRAPH 9



FISHER WOMEN PLAY AN IMPORTANT AND DOMINANT ROLE IN THE
FISHING COMMUNITY

PHOTOGRAPH 10



The Nesting information could only be collected from the men because the fresh tracks can only be sighted by the Fishermen going for the early morning cruise.

The Cruise timings vary from season to season. The Nesting period commences with the onset of the 'Easterlies', what the fishermen call 'Toorpugalulu' in Telugu. During this time the catch is also abundant.

The fishermen in this season go for 2 cruises in a day. The first cruise is at 3 am to about 9.30 - 10.00 in the morning and the second cruise in from 4.30 in the evening to about 10.00 in the night.

Mechanised fishing is completely different from traditional fishing. At Visakhapatnam and Kakinada we found different sizes and capacities of trawlers but the most numerous ones are the medium sized ones with 20-30 tonnes capacity. The cruise also varies according to the amount of packaging ice they carry. Generally the cruise lasts from a minimum of 4 days to a maximum of 15 days. The nets are laid upto 10 hrs at different depths measured in "BARS". Bait fishing is also done, both by mechanised as well as traditional boats.

Kakinada has a big boat building industry, which makes both traditional craft known as the 'Kakinada Nava' as well as large sized trawlers.

Drinking has always been a problem. Our visits had to be timed according to the availability of the Fishermen on the shore and when they were sober.

B) SOCIO ECONOMIC STATUS OF THE COMMUNITY

The fishermen's earnings vary from season to season and catch to catch. They do not have a steady income but do earn enough to make a comfortable living. The problem here is that they do earn enough but do not save and so the disparity from people who earn a steady monthly income arises. The Fishing community cannot be classified to fall below the poverty line but can be classified under the poor category.

Sometimes earnings run in lakhs of rupees depending on the catch and after distribution between the group each person easily gets about Rs.25,000/- if the catch is good. But unfortunately these people do not believe in saving for a rainy day.

C) DEPENDANCE ON TURTLES AND TURTLE PRODUCTS

The dependance on Sea turtles, specifically of the *Olive Ridley* species is confined to the domestic consumption of eggs and as and when they find them (Photograph 11). Only the freshly laid ones are consumed there is no market for these eggs and are generally distributed among friends and relatives, as and when found.

The *Calipee* of the turtle is still used by the Fishermen but again is very limited. The *Calipee* is removed from a freshly caught turtle as and when the necessity arises. It is made into a black paste after processing which is stored and apparently is very good for joint pains, pregnant ladies etc. The dosage is a very small pinch and this is generally administered free by the community priest who is again from the Fishermen Community itself.

PHOTOGRAPH 11



A NEST DISTURBED BY HUMANS, IT WAS FIRST PROBED WITH A STICK
AND THE EGGS TAKEN OUT

The younger generation believes in going to the nearest doctor for medical help. We came across the Calipee medicine, locally called 'Seshakattu' only in 2 villages! Meat is not eaten at all. Eggs also are not consumed by the entire population but only a few pockets consisting chiefly of Aged members. The common thing that was revealed from the entire stretch was that both eggs and meat have a 'Mossy' flavour that is not relished by all. The elderly people do not mind eating it occasionally. This has also become a rarity where the meat is concerned but the eggs are taken out as and when they are found. The significant thing is that no fisherman goes in search of either eggs or meat.

The conclusion that can be drawn is that the life styles have changed drastically, the catch also has changed due to the change in the type of nets. There is awareness and the extent of awareness will be explained later in this report.

D) INFORMATION GATHERED FROM OTHER ORGANISATIONS AND INSTITUTIONS

Preliminary survey also included getting as much information available on *Olive Ridley* sea turtles. I met several people from different organisations and institutions at different hierarchial levels. I have also corresponded with different people regarding information and literature.

(I) CMFRI (CENTRAL MARINE FISHERIES RESEARCH INSTITUTE)

CMFRI has been gathering data regarding incidental catch of endangered marine animals including turtles and Marine mammals. I met their field staff at Visakhapatnam and Kakinada who shared information with me.

CMFRI was also very helpful in giving a comprehensive list of all the landing centres which are also fishing villages for all the four districts of North Coastal Andhra Pradesh, the type of craft and gear used etc.

The data available on incidental catch with CMFRI is sketchy because turtles caught in the nets either in country boats or trawlers, whether alive or dead are thrown back into the sea and is never brought ashore.

CMFRI and NMLRDC (National Marine Living Resources Data Centre) have put together a project in the month of March '97 for preparing a database on the mortality of turtles and other endangered marine species (Annexure I - Form of CMFRI & NMLRDC).

(ii) MPEDA (MARINE PRODUCTS EXPORT DEVELOPMENT AUTHORITY)

This is the licensing authority for the catch and has to issue a certificate called '*DSP 1 Certificate*' (Annexure 2 - DSP 1 Certificate) for the export of fish to the United States of America certifying the use of *TEDS (Turtle Excluder Devices)*. This certificate as of now is not being issued.

(iii) FISHERIES SURVEY OF INDIA

I approached FSI after consulting MPEDA for information regarding TEDS. I met Dr. K.S. Philip, the Regional Director and the Fisheries gear technologist Mr. Paul Pandian.

They showed me the TED they had tried out. (FIG 1). They say that the fabrication costs and the extent of fish loss make it unacceptable to the fishermen where commercial and economic considerations are the highest priority.

Originally 5 TEDS were designed but only 1 model was tried out by FSI.

(iv) VSPCA (VISAKHAPATNAM SOCIETY FOR PROTECTION OF CRUELTY TO ANIMALS)

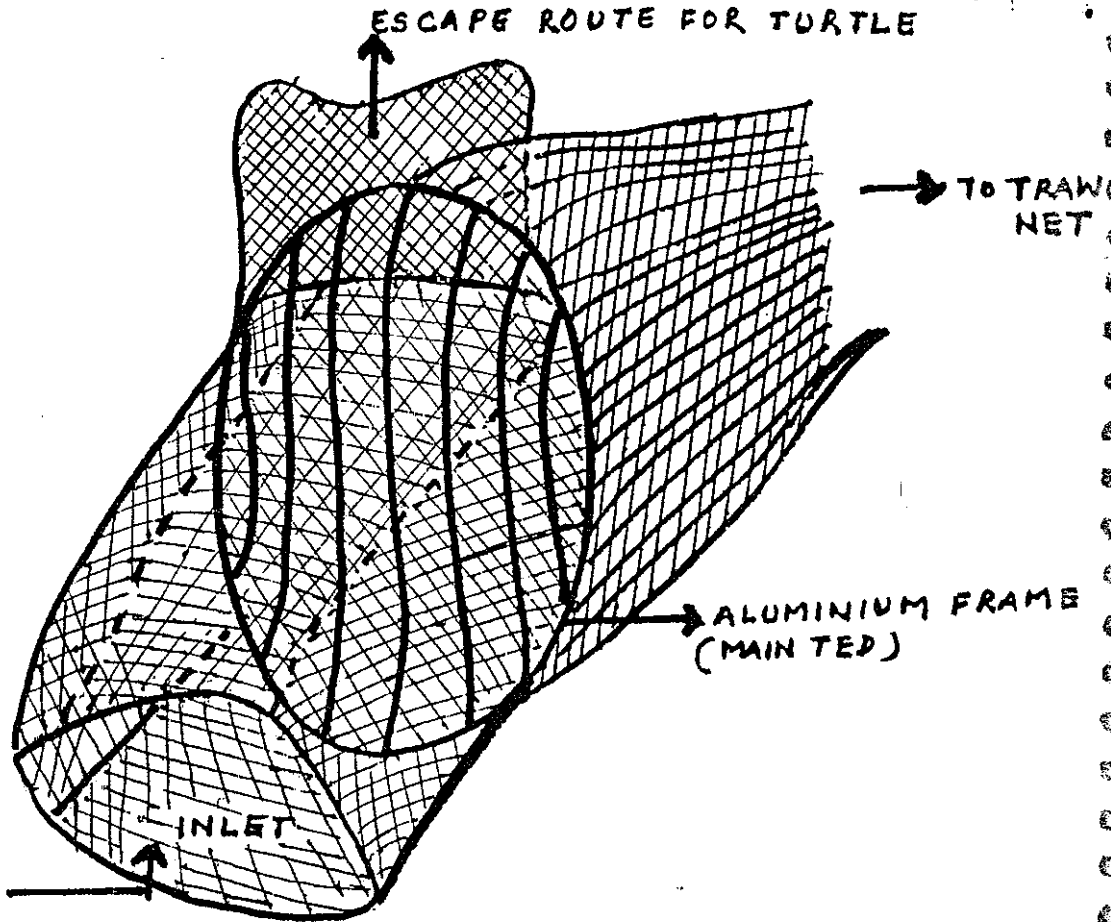
This organisation came into light when it launched a turtle egg relocation program in Vizag Urban area in the end of January '97 and was widely publicised in the local press. This program was supported by the Vizag Urban Development Authority (Photograph 12)

The eggs were procured by paying money ranging from Rs 70/- - Rs.125/- per nest to the Fishermen and relocated to an enclosure on the beach.

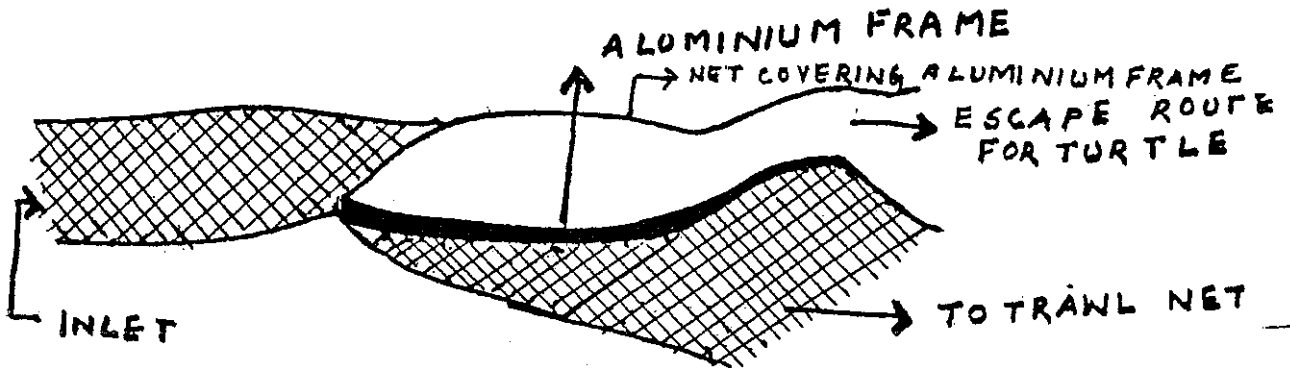
They have brought out a report. The hatching efficiency has been low and instead of releasing the hatchlings immediately, the VSPCA released them after 5 to 7 days which has created additional problem of hatchling mortality their cause is conservation but unfortunately their functioning is a little unscientific. Though we couldn't get much information from VSPCA regarding extent of nesting, we have been in constant touch with them.

FIG-1

TURTLE EXCLUDER DEVICE



VIEW FROM THE SIDE



Courtesy :

Fisheries Survey of India
Visakhapatnam

PHOTOGRAPH 12



THE VUDA AND VSPCA ENCLOSURE ON VIZAG BEACH WHERE AROUND 30 NESTS WERE RELOCATED FROM FEB TO APRIL '97

(v) ANDHRA PRADESH STATE FOREST DEPARTMENT

The wildlife division, Rajahmundry of the Andhra Pradesh State Forest Department, though not doing any work on turtles has been a collaborator in the project, especially for the survey of East Godavari district and monitoring of nesting at *Sacramento* Bay Islands. They have now initiated conservation of sea turtles at *Kothapalem* and *Sacramento*.

(vi) COAST GUARD

The Indian Coast Guard has been involved in Seaward patrolling off the Coast of Orissa, especially during the turtle Nesting season, between *Paradeep* and *Rushikulya*.

Their main job is seaward protection of the incoming and outgoing turtles. For this they have to ensure that fishing vessels get a passage to open sea and back to the shore without disturbing the turtles or indulge in poaching. Apart from this they also have a systematic record on the approximate numbers of incoming and outgoing turtles.

According to Commandant M. T. Gore, the Executive Officer of the 'District 6' Headquarters at Visakhapatnam and other Officers of the Coast Guard who have been part of the turtle patrol for the last 6 years, there is a slight change in the pattern of movement of turtles along the Coast of Orissa. They say, instead of a large group of turtles moving together, the turtles have been observed to form smaller clusters. This is the observation

made from approximately 15 km off-shore by the patrol boat. The patrol boat that has done maximum work in the above said is named "Chand Bibi". Some times, in case little more Man power or infrastructure is needed, the Navy's help is sought.

Though no information about sea ward migration in North Coastal Andhra Pradesh or other factors were available with the Coast Guard, they gave us information and guidance about identifying turtles killed deliberately or decapitated on purpose like clubbed skulls or chopped off heads etc.

The most important observation that has to be considered carefully is the 'Change in the migration pattern' and breaking up of the large group into smaller clusters.

There are a few other organisations like the Andhra Pradesh State Fisheries Department, MSSRF (M.S Swaminathan Research Foundation, at Kakinada), BOBP (Bay of Bengal Post harvest Project) etc. who were contacted but they couldn't be of much help

NESTING

The Nesting is medium to low sporadic all over the Coastal stretch of North Andhra.

On an average the numbers given by the fishermen was 4-5 nests per village per season. In terms of nests per km, it is difficult to say. The nests

are laid on the higher reaches of the beach, well above the high tide line, though the distance has varied. Generally the nests were found near the beach vegetation. The Fishermen also said that the nests were laid approximately at the same place every season plus or minus half a kilometre.

I was also given tag numbers of turtles tagged at Gahirmatha by Mr. Pandav of WII and was asked to enquire about them. None of the Fishermen I met reported seeing any tags though they have sighted mating pairs off the coast in this Area. I also distributed self-addressed post cards but haven't got any information. The number of mating pairs also varied sometimes 3-4 pairs were sighted and sometimes a single pair and the sightings have been reported generally during night time in the months of October, November and December.

None of the dead turtles I came across during the 97-98 season bore any tags.

During the preliminary survey, 2 sites of significance were identified :

- (1) *Kopaskudd* (Near Kaviti in Srikakulam)
- (2) *Sacramento* (Near Kothapalem village in the heat of the Godavari Delta).

We visited *Kopaskudd*, the norther a most part of the study area in January '98. This village is about 70 km South of *Rushikulya*. It is about 260 km from Visakhapatnam and is not easily accessible. The nearest town is Kasibugga also called *Tekkali*.

Kopaskudd a small village with a population of approximately 350 families is a very good site and the number given by the Fishermen during the survey is 250-300 nesting turtles per season. When we visited *Kopaskudd*, the nesting had not commenced though we sited about 4 dead adult turtles in different stages of decomposition on the beach. They were washed ashore.

This site due to infrastructural difficulties and lack of man power was abandoned for monitoring during the nesting season.

Sacramento island an intertidal sand bar at the mouth of the Godavari is also a good site. I was able to visit *Sacramento* for the first time in February '97 which was significant because the nesting was just over. Predation due to jackals is very high and we could see about 30 freshly destroyed nests (Photographs 13 & 14). This sand bar is uninhabited during the major part of the year but the Fishermen and their families set up temporary habitation here, the time coinciding with the time of nesting. They come here for catching Prawn/Shrimp seed for which they plant poles and the nets (Photographs 15 & 16). These fishermen come from the nearby '*Kothapalem*' village, a medium sized village with a population of approximately 3000, is the nearest village to *Sacramento*. It takes about 45 minutes by ordinary country machine boat from *Kothapalem*. This is the only means of transport to get to *Sacramento*.

I have been able to establish good rapport with the people of *Kothapalem*. Nesting according to them starts after the '*Mahashivratri*'

PHOTOGRAPH 13



PREDATION BY JACKALS AND DOGS CAN BE IDENTIFIED DUE TO
THE SCATTERED EGG SHELLS AND HALF EATEN EGGS

PHOTOGRAPH 14



PHOTOS 13 & 14
COURTESY- A. P. STATE FOREST
DEPT.
CORINGA WLM

PHOTOGRAPH 15



NETS AND POLES TIED FOR CATCHING PRAWN SEED
AND A FISHERMAN COLLECTING PRAWN SEED

PHOTOGRAPH 16



festival and the extent of nesting is approximately 150 nesting turtles. I have specified only the number of nesting turtles because the fishermen were able to give the number from the tracks they had sighted and this may not necessarily mean the number of nests but does give an indication regarding the number.

Sacramento, a site with very difficult accessibility but due its proximity (about 3 Hrs) to Kakinada and due to the help of the wildlife division, Rajahmundry of the Andhra Pradesh Forest Department, could be monitored for the '98 season based on the findings of the preliminary survey.

NESTING SEASON AND WORK DONE THERE IN

As already mentioned, only *Sacramento Bay Island* was monitored due to the help and cooperation of the Andhra Pradesh State Forest Department.

This island or rather an intertidal sand bar is approximately 6-6.5 sq.km. in area surrounded by water. One side is open sea and the other side is intertidal estuary of River Godavari.

Beach vegetation consists of *Ipomea*, *Mangrove vegetation* and very few *Acacia* bushes at the inner end.

The turtles arrive on the Northern part of the sand bar which consists of soft fine sand and enough area ahead of the High tide line for nesting. There are no sand dunes but the area is slightly slopy:

Behind the sand bar, big intertidal pools and Marshland is seen, rich in Algae, small Molluscs and shell fish. This area is an area where birds of different species, especially Flamingoes are seen.

MONITORING FOR NESTS

(Photographs 17, 18, 19, 20, 21 & 22 show the complete nesting process)

S.No	Months	Date	Nests Yes/No	Number	Carcass Info.
1.	Jan	23.01.98	No	-	8 (1 Fresh)
2.	Feb	08.02.98	Yes	2 (17 Paces from HTL)	-
3	Feb	10.02.98	-	Unsuccessful	-
4.	Feb	12.02.98	No	-	6 (All Fresh)
5.	Feb	23.02.98	Yes	1 (At 1:30 am)	-
6.	Mar	10.03.98	Yes	2 (At 4 & 5:30 am)	-
7.	Mar	11.03.98	Yes	2 (Time not known)	-
8.	Mar	13.03.98	Yes	2 (5:30 & 6:30)	-
9.	Mar	14.03.98	Yes	3 (1 Unsuccessful) Time not known	-
10.	Mar	22.03.98	Yes	2 Nests (1:35 & 2.40am)	-

PHOTOGRAPH 17

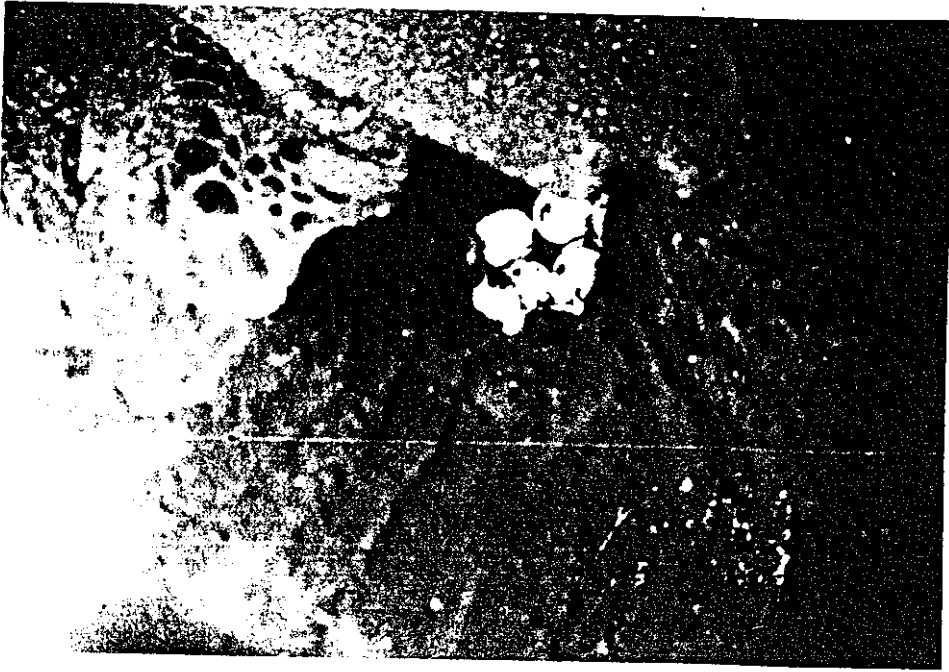


THE TURTLE PREPARING THE NEST BY DIGGING WITH
ITS HIND FLIPPERS

PHOTOGRAPH 18



PHOTOGRAPH 19



THE PROCESS OF EGG LAYING THAT LASTED
AROUND 40 MINUTES

PHOTOGRAPH 20



PHOTOGRAPH 21



THE TURTLE COVERS UP THE NEST AFTER COMPLETING THE
EGG LAYING AND IS ON ITS WAY BACK TO SEA

PHOTOGRAPH 22



In the month of February, between 23rd Feb and 14th March, 172 carcasses, all female were counted (Photographs 23 & 24).

During this time 7 families of fishermen were stationed at *Sacramento* and they helped in finding the tracks and nests. They also stayed up with us in anticipation of sighting an approaching turtle and witnessing the nesting.

(1958)
This year, the nesting commenced very late, that is at the end of February, as compared to last year when nesting was over by the 1st week of February. The turtle mortality has also been alarmingly high.

Predation due to Jackals is also very high at *Sacramento*. This year due to the presence of the Forest Department staff and the Fishermen who are being paid an honorarium for protecting the nests, there was less destruction. Last year almost 95% of the nests were destroyed. Additionally 'Crabs' and 'Seagulls' which are in abundance here, form an additional predation species, especially for the hatchlings.

The most alarming factor is the high and increasing number of Dead Adult Female Nesting Turtles being washed ashore. I was a personal witness to a jackal tearing open the front left flipper of a fresh dead turtle just washed ashore (7:55 pm at Sacramento) and it managed to pull out 17 eggs from within the turtle. A truly gory scene!

PHOTOGRAPH 23



THIS IS A FRESH TURTLE JUST WASHED ASHORE
(AT 7.55 PM, 11th APRIL AT SACRAMENTO)

PHOTOGRAPH 24



THIS PHOTO SHOWS THE HIGH MORTALITY WITH 7 DEAD TURTLES
LYING CLOSE TO EACH OTHER

AWARENESS LEVEL AND PROTECTION STRATEGY

Olive Ridley sea turtle (*Lepidochelys olivacea*) is a protected animal under Schedule I of the Wildlife Protection Act. It is also listed as an endangered species in the Red Data Book of the IUCN (International Union for Conservation of Nature and Natural Resources).

All along North Coast of Andhra Pradesh, the Fishermen are aware that killing, capturing or harming this animal in anyway will lead to prosecution. There were instances where fishermen going upto Paradeep for fishing, reported cases where Fishermen (Origin not known), were arrested for catching the *Olive Ridley* turtle

But unfortunately this fear or awareness does not extend to the eggs. The eggs are removed as and when found (See Photograph II), though no market exists for them. I did not at any point of time come across export of turtles to any other State.

The Andhra Pradesh Forest Department has also done quite a lot and is still doing in the conservation of sea turtles.

We came across 2 instances (Pudimadaka and Sacramento) where persons from the fishing community were engaged and paid an incentive in the form of an honorarium, to see that no poaching or disturbance to the nests is being done. This has been successful.

At 'Pudimadaka', traditionally a village known for its skill in Shark fishing was known for its notoriety in capturing turtles and using its meat for bait. The nesting in and near this village is scant but the fishermen were known to capture the turtles from the sea, especially while the turtles mate.

Since the last 10 years, the Forest Department has been very successful in putting a stop to this practice. It has been monitoring this village every season and has also placed a warning board on the village's Panchayat Office stating that catching *Dolphins* and *Turtles* will lead to prosecution. They also have a young man named 'Ramu' who oversees the catch. He has been doing a good job and is doing full justice to the incentive given to him by the Forest Department (The incentive is Rs.200/- per month).

Awareness regarding the law is quite clear amongst the Fishermen but they fail to understand the necessity of conservation and view it as just another whim of the educated and salaried class. But there are also people within the community who understand why conserving the sea turtle is important. They also believe that when the sea turtles visit the beaches to nest, the sea condition is good and so the catch will be good. It is this attitude that can be cashed upon for a successful conservation program.

CONSTRAINTS

Constraints during the project have been manifold, especially since this project involved constant travel to quite a few inaccessible places. It also required that I always be ready for quick mobility, hence the biggest problem has been that of transportation.

Manpower and other infrastructural deficiencies has not made the work any easier. Infact in several places I had to go alone to the fishermen's villages and approach them directly especially in places where no Non-Governmental Organisations, Forest Department officials or a local contact could be identified. This aspect has considerably slowed the progress of the preliminary survey. At places drinking water problem has also been a constraint due to the transportation problem. It is not always possible to carry water especially when I already have heavy baggage containing personal and field equipment, I have to depend on the local available water. This has led to my falling sick a few times, hampering field work

Documentation has been lost at 2 places because the loading mechanism of the photographic equipment malfunctioned due to which the photographs of 2 precious field trips were completely washed out.

Monitoring during the season has only been possible because of the help and co-operation of the Andhra Pradesh State Forest Department. The Sacramento sand bar does not have fresh water and everything from water to food to tents has to be physically transported to the site.

The Coringa Wildlife Management of the Andhra Pradesh State Forest Department has been able to provide an escort everytime I needed to visit Sacramento. This place is 4 hrs. by road from Kakinada upto Kothapalem village and a 45 minute boat ride from there. There is no public transport facility to Kothapalem.

Additionally finances have been a constant problem. It is infortunate that we as CCV`s are given finances at the end of the quarter. In my case the project work has been possible only because of my parents providing the financial support. I am sure everyone working on a project of this type will realise the kind of expenses incurred and the difficulties involved therein

Despite the initial disappointments, physical discomforts and agonising waiting periods between field trips, the work has been satisfying and enjoyable. It has provided a tremendous impetus to my experience in field work and deepened my foundation in Ecology and Environment.

CONCLUSION AND RECOMMENDATIONS

Considering the high mortality rate, the changing migratory patterns and abandonment of the Arribada nesting site at Gahirmatha for 2 successive seasons, it becomes essential that a concerted effort be made by all people, institutions and organisation to investigate the deaths and formulate a conservation plan/program to save the Olive Ridley species of the sea turtles. Though the survey and a single season monitoring does not provide ample scope regarding nesting of the Olive Ridley but does indicate the need for urgent measures to be taken, if possible, before the next nesting season begins.

Taking the work done so far i.e. January '97 to May '98 as the basis, here are a few recommendations.

1. A complete coordinated and comprehensive study regarding the extent of nesting on the Andhra Pradesh Coast needs to be done especially in lieu of the facts that the migration pattern has changed and the Olive Ridleys having abandoned the biggest arribada nesting site for the last 2 successive seasons.
2. The cause of high turtle mortality has to be investigated and a Post Mortem must be done by proper authorities of a fresh specimen either in Orissa or else where.
3. Acceptable TED design must be made. The use of TED cannot be enforced and the design has to be made user friendly. For this environmental education and awareness regarding conservation and use of TED is an essential step.
4. Habitat destruction by various activities, developmental or otherwise needs to be looked into. Areas demarcated as high intensity nesting area should be protected, at least during the Nesting season.
5. For protection and conservation, community based participatory conservation should be done by mobilizing finances, resources and infrastructure by either Non-Governmental Organisations or the State Forest Department.

6. Finally WWF-India can form a media by which Scientists and Conservationists working separately can be brought on to a common platform by which a combined, concerted and a forceful attempt can be made for saving the Olive Ridley.

7. Trouble for Turtles - Mainstream, Vol.8, No 4, Fall 1977.
(Courtesy Dr Harry Andrews, Madras Crocodile Bank Trust)
8. IUCN/SSC - A Global strategy for conservation of Marine Turtles -
Prepared by IUCN/SSC Marine Turtle Specialist Group.
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9. Temperature Controlled Sex determination in Sea turtle
Lepidochelys olivacea - C.J. Mc Coy, Richard C Vogt, Ellen J
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(Courtesy Dr Harry Andrews, Madras Crocodile Bank Trust)
10. Present Status of the Turtle Fishery in the Gulf of Munnar and the
Palk Bay - S.Jones and A.Bastian Fernando (CMFRI)
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11. The Turtle Paradise : Gahirmatha - M.C.Dash and C.S.Kar.
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12. Sea Turtle Mariculture - A review of relevant information for
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2. A Preliminary Survey of Sea Turtles of the Andhra Coast - S.Biswas, Bulletin of Zoological Survey of India (1984).
(Courtesy Bivash Pandav - WII).
3. Mortality of Olive Ridley Turtles, *Lepidochelys olivacea* due to incidental capture in fishing nets along the Orissa Coast - B.Pandav, B.C.Choudhary and C.S.Kar, Oryx Vol 31, No 1, Jan.97.
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6. IUCN/SSC - A Marine Turtle Conservation Strategy and Action plan for the Northern Indian Ocean - Prepared by Marine Turtle Conservationists in Northern Indian Ocean region and the IUCN/SSC Marine Turtle Specialist Group.
(Courtesy Dr Harry Andrews, Madras Crocodile Bank Trust)

15. Conservation and Management of the endangered Olive Ridley Sea Turtle *Lepidochelys olivacea* (Escholtz) along the Northern Andhra Pradesh Coastline - P.S.Rajasekhar and M.V.Subba Rao - Testudo (British Chelonia Group) Vol.3, No.5.

(Courtesy Dr P.S Rajasekhar)

16. The Fauna of British India by Malcolm A. Smith (1920 edition) -
Source : Andhra University Library.

ANNEXURE-II

Source: IAPEDA VSP
 Nr. No. 20
 June 17
 No.



OMS APPROVAL NO. 1405-0095
 EXPIRATION DATE 7-31-96
 ESTIMATED BURDEN : 30 Minutes

US DEPARTMENT OF STATE
SHRIMP EXPORTER'S/IMPORTER'S DECLARATION

(SEE INSTRUCTIONS ON REVERSE)

1. HARVESTING NATION	2. AQUACULTURE FACILITY (if applicable) (Name & Address)
3. EXPORTER (Name, address and Tel/Fax)	4. U.S. IMPORTER/ULTIMATE CONSIGNEE (Name, address and Tel/Fax)

5. DATE OF EXPORT

6. DESCRIPTION OF PRODUCT		
U.S. HTS Tarrif Schedule Number	Number of Units	Net Weight in Kilograms

7. EXPORTER'S DECLARATION *(To be completed by a responsible agent of the exporter of the product)*

I hereby declare that the shipment of shrimp accompanying this declaration was *(check one)* :

A. Harvested in a manner not harmful to sea turtles. Check the condition of harvest which applies :

1. _____ Harvested by aquaculture	2. _____ Harvested using TEDs
3. _____ Harvested using non-mechanical net retrieval	4. _____ Pandalid or other cold-water species harvested in areas where sea turtles do not occur.

B. Harvested in the waters of a nation currently certified pursuant to Section 609 of P.L. 101-162.

EXPORTER (Name and title)	SIGNATURE	DATE
---------------------------	-----------	------

8. GOVERNMENT CERTIFICATION *(Necessary only if box 7a above is checked; to be signed by a responsible Government official of the harvesting nation)*

I hereby declare that the statement signed above by the exporter of this shipment of shrimp are true and accurate to the best of my knowledge

NAME AGENCY, TITLE	ADDRESS/TEL/FAX	SIGNATURE	DATE

9. IMPORT INFORMATION *(To be completed by U.S. importer or Customs broker).*

DATE OF ENTRY	PORT OF ENTRY	ENTRY NUMBER	SIGNATURE

THIS FORM MUST ACCOMPANY ALL SHIPMENTS OF SHRIMP AND SHRIMP PRODUCTS INTO THE UNITED STATES

FORM 6-95 DSP-121

* Public reporting burden for this collection of information is estimated to average 30 minutes per response, including time required for searching existing data sources, gathering the necessary data, providing the information required, and reviewing the final collection. Send comments on the accuracy of this estimate of the burden and recommendations for reducing it to: Department of State (OIS/RA/DIR) Washington, D.C. 20520 0364 and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Paperwork Reduction Project (1405-0095), Washington, D.C. 20503