REPORT ON THE TURTLES

Bhimili Beach Sand Project

Review of the Coastal North East Andhra Pradesh

By

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Report on the Turtle

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1. The Book of Indian Reptiles states that the Ridley is widely distributed in the tropics of Indo-Pacific and the East Atlantic and is the commonest turtle along the Indian coasts The *major nesting beach in India is the Gahirmatha of the Orissa* coast in Balasore District where over 100,000 turtles come ashore to nest in about 10 days

B C Choudhary reported that 5 species of turtles ---Olive Ridley, Green sea turtle Hawksbill Leatherback and the Logger-head occur in the Indian coastal waters and Bay Islands Out of these, *except the Loggerhead the others nest on the mainland coast*, of which *Olive Ridley is the most common on the eastern coast*

Mass nesting of Olive Ridley was first brought to light by H R Bustard of FAO as *a unique social behaviour* not reported in other species of sea turtles (Priyadarshini)

Choudhary quoted that *there were only 4 significant "arribada" (mass nesting) beaches in the world.* Two are on the Pacific coast of Costa Rica, the third of Mexico, while the *fourth is on the Indian coast at Gahirmatha in Orissa* He stated that in most parts of their distribution range sea turtles nest sporadically, but in certain locations their strategy differ by adopting mass nesting In this case they congregate in very large numbers in favourable coastal waters and synchronise nesting wherein hundreds and thousands of individuals come to suitable nesting beaches He quoted authorities to explain this phenomenon as a survival strategy

2. Readers Digest July 99 issue *"To save the turtles"* by Jennifer Gamble states that "Ridleys are the most common, with over one million still surviving Other species (All seven species are protected) It is better to protect turtle nesting grounds, but that cant always be achieved. It is impractical to preserve long stretches of beaches in poor countries like Sri Lanka notes micro-biologist Sri Wickerem Singhe, who helped develop plans for hatcheries

3. Turtles in Orissa (B.C. Choudhry)

In Orissa more turtles nest than anywhere else in the world (Silas et al, 1984) reaching to over half a million every year at Gahirmatha (Dash and Kar, 1980) The second mass nesting ground was discovered in 1981 at Devi river mouth in Cuttack District of Orissa Inspite of all previous surveys Choudhary reported that *no one gave the intensity of sea turtle nesting*.

Choudhary investigated and reported the Gahirmatha coastline as being 35 km and intercepted twice by the rivers Maipura and Baunsagada with a long sand spit of over 4 km length on the mouth of Maipura There are extensive mangrove forests present behind the casuarina plantations from mouth of Maipura to the mouth of Baunsagada, and three offshore islands are located a few hundred meters inside the Bay of Bengal in the stretch between Dhamra and Maipura mouth

The Devi coast is 30 km extending from mouth of rivers Banihara to Kadua intercepted by mouth of Devi river and includes island Akasdia in the mouth of the river, The sand pit to the southern side of Devi mouth extends upto 3 km with an average width of the sand spit being 300 m and having scattered dunes 2-3m high, with a beach vegetation comprising of *Ipomea perscaprae* and *Spinifex littoreus*, backed by casuarina.

The Gangam coast close to AP is 60 km and is intercepted by two rivers Rushikulya and Banda, and two rivulets one near Gopalpur town and another near Markandi village Sand spits more than 2 km are present on both sides of the two river mouths The Indian Rare Earths Ltd are mining the beach sand near Chatrapur town

Choudhary *surveyed in three phases of pre-nesting, nesting and post-nesting periods*. The nesting surveys were done from December 1993 to April 1994 during expected nesting period, in the probable nesting sites----sand spits on river mouths Based on the surveys 8 sites were selected for intensive monitoring, narrowing down to the sand spits on the banks and mouths of river Mahanadi, Devi, Rushikulya and Bahuda; and Akashdia island near Devi mouth, of which *only 4 sites namely* Gahirmatha, Devi, Chilka and Ganjam coasts covering 195 km *had significant nesting intensity*.

1 Gahirmatha Coast: has no other species apart from Ridley The coast is relatively shallow and a known mating grounds Here nesting was sporadic from November to April, with mass nesting starting on 2nd February 1994 at 12 noon with 170 turtles

increasing to 1,00,200 till night The intensified nesting continued till 4th night, and by 13th about 5,25,000 (i.e over half a million) nests were made in the 4 km stretch *averaging 1 25 000 per km* as compared to only 280 nests on 4 km at Great Nicobar Island averaging 70 nests per km The nestings were recorded and peaked in March Normally the nesting event occurs over short periods of 5-6 nights The second nesting took place after a gap of 42 day of the first mass nesting This second mass nesting usually coincides with the peak hatching period of the first mass nesting Earlier second mass nesting was reported by Dash and Kar as ranging from 46-58 days after the first In Gahirmatha this *mass nesting is called* as Ekakulanasi rookery which is the largest in the world

Balsore coast site had no evidence of nesting This was presumed as due to the substrate being unsuitable, being shallow, which during low tide exposes vast stretch of the sea bed, and becomes hardened after exposure

Sporadic nesting occurs along Paradeep coast from January and February intensity being maximum in Huktola island with around100 nests

2 Devi coast about 100,000 nest occurred over 4 km stretch averaging 25,000 nests per km On Akashdia island adjoining the beach on the southern side of the Devi mouth where the sand spit varied from 300-400 m and is 4 km long, the *intensity was estimated* at 15,000-22,000 nests *averaging 4000-6500 nests per km*

3 The Chilka coast considered a poor nesting area had *an intensity of 20 per km* over a 14 km stretch from Puri to Chilka mouth; also had sporadic nesting over 56 km from Chilka mouth to Prayagi averaging 6-7 nests per km It was again 17 per km from Prayagi to Ramlanka

4 Rushikulya mouth on Ganjam coast is the new find 1km east of Madras-Calcutta highway. It is spread over 6 km The beach is more or less flat with scattered sand dunes 1-2m high and with an average width of 80M above the high tide level, in some places extended upto 100 M width with *Ipomea* and absence of *Casuarina* The back waters of river Rushikulya extends 6 km northwards along the nesting beach The peak season for nesting recorded from 1st to 8th March 94 and estimated to be 200,000 nests *averaging 30-35 000 per km*. Nesting continued from night till 11 00 am next day Maximum nesting occurred in a km stretch, and a 4 km stretch with intensity particularly high on

the beach in front of Gokharkuda village which was earlier the mouth of the river Rushikulya, before it changed its course. Hatchlings emerged from 21st April 94 and continued for 4 nights. Sporadic nesting was also noticed and counted along the river Bahuda *with 180 nests over 47 km length*

Casuarina plantations were considered as great hindrance to nesting. One of the conspicuous features of the Rushikulya nesting beach is the absence of casuarina plantations. These plantations not only make digging of nests difficult by the root system but also harbour the predators like dogs, jackals, and hyaena

Egg collection by local fishermen was observed for eating and not exploiting for any commercial purpose. When embryonic development starts in the eggs they become unsuitable for consumption. Only a few fishermen eat turtle meat, and there is no market for it. Its meat is used as bait for attracting sharks which is relished. Many do not consume the meat and eggs on religious taboos.

Large scale mortality is reported due to turtles getting entangled in fishing gears operated by mechanised boats when they die either due to suffocation or are clubbed to death. Even beach erosion results in great losses of eggs, to as much as 50% as reported at Gahirmatha; and was also observed at Devi and Rushikulya rookeries during March-April 94.

Sporadic nesting is spread all along the Orissa coast while concentrated nesting is confined to critical nesting habitats. Therefore Choudhary suggested **a network of coastal protected areas as desirable** *especially* **at the concentrated regions**. Gahiramatha was protected in 1975 by declaration of the Bitharkanika Wildlife Sanctuary. In 1993 the Govt. of Orissa declared no fishing zone upto 20 km of Gahirmatha coast and proposed to make this a Marine Sanctuary to protect other marine animals like Humpback dolphin (*Sousa chinensis*), Snub-fin dolphin (*Orcaella brevirostris*) and the Finless-porpoise (*Neophocaena phocoenoides*). Ban was proposed to casuarina plantations in important rookeries like Gahirmatha, Devi and Rushikulya coasts along the high tide line, leaving 100m space from high tide line free to provide for nesting. There is a **need for creating public awareness for the conservation** *and to have volunteers and educated youth to advise and protect during the nesting season.*

4. Status, Ecology and Management of Olive Ridley Sea Turtles and Their Nesting Habitats along North Coastal Andhra Pradesh By K V R Priyadarshini as a part of the CCV project of WWF-India covering a period from January 1997 to June 1998, that is two nesting seasons. The summary of her report is as follows:-

In this project coastal AP covering coast off Srikakulam, Vijayanagaram, Visakapatnam and E. Godavari were taken up covering 370 km. to know if large scale mass nesting occurred as reported in Orissa to the south of Rushikulya in Orissa. This interest is all the more because Kurma avatara is believed to have originated from the sea in this area between Vamsadhara and Nagavalli rivers, where the ancient temple Srikurmam is located in Srikakulam.

This area supports a variety of flora and fauna, most popular being the Sea Otter, Gulls, Caspian Tern, Pied King Fisher, Riverine Tern, Grey Heron, Flamingo, Curlew, Egrets, Pond Heron, etc.

The region was identified as one of the important sporadic nesting regions for Ridleys from December to Mid-April. It was learnt that two other species also visit the area namely Hawksbill and Green Turtle, though not reported as seen.

Complete preliminary survey during both nesting and non-nesting seasons, at every 10 km stretch was done and information collected. Based on the survey, *sites were identified for* high intensity nesting for detailed study.

One site is Kopaskudd (Kaviti Mandal) in Srikakulam about 70 km from Rushikulya accessible from Kasibugga (Tekkali) and 260 km. from Visak, was reported as having 250-300 nesting turtles per season.

The other site is Sacramento Bay Islands near Kakinada comprising of inter-tidal sand bars at the mouth of Godavari were identified. This island is 6 to 6 5 sq. km in area with one side opening to the sea and the other to the inter-tidal estuary of Godavari. Information gathered had revealed the nesting starts with onset of Easterlies or "*Toorpugalulu*" when the fish catch is also abundant. The fishermen of Kothapalem inhabiting these islands temporarily reported nesting as starting from Mahasivarathri and the extent as around 150 nests.

It was concluded, except these two sites, the rest of area had medium to low sporadic nesting all over north Andhra coast, with *an average of 4-5 nests per village per season*

In terms of nest per km it was not concluded, as survey was done village-wise along coast line. However considering the length of coast and villages *it is 2-3 nests per Km*. The nests are found on the higher reaches of the beach, well above the high tide line, and the distances varied Generally the nests are found near beach vegetation like *Ipomea* with *Acacias* and a few mangroves at the inner end The fishermen concluded that nests are laid at same place year after year with a shift of half a km this way or that (plus or minus) They also reported sighting only 3-4 pairs mating and sometimes only single pair, generally during nights in October-December The turtles arrive on northern part of the sand bar, which consists of soft fine sand, enough distance from the high tide line for nesting There are no sand dunes but the area is slightly sloping Nesting commences between first week and last week of February Predators here are crabs, seagulls and jackals

Dependence on sea turtles for eggs is only for domestic consumption that too among the older generation and distributed to friends and relatives *Only freshly laid eggs are consumed and there is no market for the eggs* The calipee has also a limited use as a medicine which the younger generation have lost belief Meat is not eaten at all because of the mossy flavour not relished by all Fisher men do not go for the meat and eggs as such but *take it when found* The life styles have changed drastically The fishermen kill turtles at sea for using them as bait for sharks.

Employing locals in the season at Rs 200 per month to protect was successful and a good incentive, especially since they are not interested in meat and eggs She **recommended protection of high intensity nesting areas at least during nesting season.** For this protection *a community based participatory approach be adopted* by mobilising finances resources and infrastructure of either NGO or Govt

5. Report on the Protection of Marine Turtles at the coast of Visakapatnam (Dated 21-10-98) by *Visaka Society for Preservation of Cruelty to Animals* is a private independent study in 1997 and 1998 based on actual happenings in a range of 4 km considered it as good nesting area

This was a very good study on the distance of nesting from the high tide level covering 113 nests Such data was not available in the various literature I have referred and also

through my several discussions with those interested in turtle conservation Results are thus very revealing:

Distance *from high Tide level:*	No of Nests	% of nests	
10 Feet	6	5 0	
15 "	4	4 0	
20 "	12	11 0	Approaching peak
25 "	41	36 0	Peak nesting distance
30 "	40	35 0	Peak nesting distance
35 "	6	5 0	
40 "	4	4 0	

Nearly 82% of turtles nest from 20'-30' from high tide level (summer level). On an average 120 nests along 4 km that *is 30 per Km.* (June 1999 report):--Where nests are laid beyond 40 feet from shore and no shrubs nearby, there was death of baby turtles on the way to the sea due to extreme heat on the surface Thus most babies die when nest is very hot Nests laid near the shrubs have been found to have good success in hatching This Society in their letter dated nil submitted on 29th October 99 after inspection of sites along the beach from Coastal Battery to the proposed Dolpinarium area of Visak zoo They explained the ***sea-levels phenomenon*** *observed by them* and its *relevance to egg laying.* They stated during the inspection that the sea level recedes and the stretch of the beach widens from around now to *April-May when the beach width is widest* and much of the *area now submerged is exposed* and many small rock formations now not seen are visible and partially exposed They clarified and confirmed that the *distances measured* as above were done by tapes as above with *reference to the high water tide level as in April-May when the level is at the lowest.* They stated that the present (October) low tide mark has submerged most of the egg laying spots This revelation came to light with reference to the Coastal Battery area where there was no sandy beaches seen now while they stated it to be an important area of nesting Thereafter they had shown several other areas to justify their observation They explained the **need to protect such localised spots intensively where such concentrations occur** They desired we visit sites to the south of the Dolphins nose of Visak towards Gangavaram and Pudimadaka beaches as

being the best areas for nesting Hence the areas of interest to the Mining (Indian Rare Earths Ltd.) did not seem of much interest from turtle nesting They did not seem to be aware of any concentrated nestings northwards towards Srikakulam

It is conclude that the **nesting here is nowhere compared to that anywhere on Orissa** and in particular Gahirmatha coast, *even in comparison to the sporadic nesting there.*

6. Reported by Hindu dated 18-1-99: "Fishermen slaughtering turtles, dumping carcasses into the sea"

A team trekked from Paradip in Orissa to Visakapatnam found hundreds of dead turtles between Srikakulam and Puri in Orissa and by the time reached Konarak counted 500 dead "Incidentally *we found only one turtle dead in the entire coast of AP*" The team walked nearly 500 km crossing 137 villages and 27 streams (This is indicative that where the intensity of occurrence is low, there are lesser kills)

7. A Project Report for the 'Protection and Conservation of Sea Turtles' at Visakapatnam: *An Environment Development Programme* for 1998-1999 Submitted by *Visaka Society for Prevention of Cruelty to Animals* to WWF India (APSO) based on their own private personal interest in June 1999 and copy to Shri Samar Singh, Secretary General WWF India, New Delhi

This is based on protection during 1998-99 at the coast of Visakapatnam, Gangavaram and Pudimadaka, and experience of 3 years of effort

The terrain from Coastal Battery to Yoga village is **excellent nesting ground**, (From local understanding point of view, and *lack of understanding of meaning of excellent* with reference to Orissa) with very high concentration, inspite of thousands of tourist streetlights, constant noises, human use for natures call, dog menace, high pollution filthy rubbish and waste dumping, flow of drainage wastes

Pudimadaka beach is excellent nesting ground for turtles (Contradicts statement of Priyadarshini-- Nesting near Pudimadaka is scant as reported by fishermen However it is scant with reference to the two concentration areas identified by her as a totality of AP coast from Kakinada to Srikakulam---Orissa border as stated above)

Nesting noticed from 21st January to 9th May 1998 This year egg laying was systematic with heavy concentration noticed in March and April, though it started in last week of February 1999 High tides in May washed away the nests near the shore (This may require dumping to prevent such losses)

Hatchlings come out mostly during midnight If shore lights are on they move towards it and become prey to the predators (Avoid lights on such occasion) Baby turtles stay put near the rocks in shallow water (need for such provision if possible) Nest concentration was high where shore lights are present (possibility of having them during the nesting season in high intensity in sanctuary area)

'As per indications since last three years we are of strong opinion that this area (nesting of sea turtles with heavy density within 40 km range from Coastal Battery to Yoga village) could become a major nesting ground for a serious attention of all concerned" **Protection efforts should include use of turtle exclusion devices and relocation of eggs from scattered areas to breeding grounds under protection.**

8. Letter of Principal Secretary to Government of AP (EFS & T Dept) dated 17-8-99 to Principal Secretary to Govt Industries and Commerce Dept quotes Chief Wildlife Warden suggesting *"an area of 150-200 meters could be delected from the high tide line* as a safety zone *to avoid disturbance to the turtles* which nest from January to June every year" The following precautions could be taken up:

a Fencing may be erected beyond 150 meters from the high tide line to avoid disturbances to the turtles due to mining operations

b Over burden removed during mining is not dumped towards nesting areas

c Wherever nesting is noticed sound and other disturbance shall be prohibited in consultation with the Chief Wildlife Warden

Report of Chief Wildlife Warden, Govt of AP to Special Secretary to Govt EFS & T Dept dated 30-7-99 states following sites were utilised by turtles for breeding during 1999 season:

(My rating is given in italics in the first column on the totality of this Visak area The nesting is compared to the poor areas in Orissa like Paradip and Chilka coasts with sporadic nesting and Greater Nicobar Island.)

Site No and *my remarks on nesting*	Coast area of beach	Stretch covered (Km)	Period of nesting	No of nests	*Average No of nests per Km.*
1 *Good nesting area*	Visak port area	4 0	28 1 99 to 27 6 99	146	36 5
2 *Poor nesting area*	Visak beach	10 0	11 2 99 to 29 5 99	52	5 2
3 *Very poor nesting area*	Rushikonda to Bhimili	16 0	25 1 99 to 15 6 99	44	2 75
4 *Poor nesting area*	Gangavaram area	10 0	11 1 99 to 3 6 99	54	5 4
5 *Fair nesting area*	Pudimadaka beach area	9 0	14 1 99 to 23 5 99	93	10 33
TOTAL		49.0		389	7.94

9. Report to Shri Samar Singh, Secretary General WWF-India, New Delhi Dated 30-7-98, by *Visaka Society for Prevention of Cruelty to Animals* and copy to WWF India (APSO) Hyderabad "Our **main constraint is funds** to document and protect from dogs, jackals, crows and crabs"

10. My visit and discussions from 25th to 29th October 1999 to Visak with reference to the proposed mining areas from Rushikonda upto Nellimerla river mouth is as follows:

I visited every fishing and regular villages along this stretch of the coast

On 25th I covered from the other side of the Gosthani river from Bheemili to Nellimerla (Champavati) river mouth I visited Nagamapalem, Chinnanagamapallem, Annavaram, Dibbalapalem, Kancherupalem, Mukkam, and Kongavanipalem and the hamlets under them on the coast I inquired about the occurrence and intensity of turtles and their nesting from the locals of different age groups (*children to old folk*) to know at first hand their interests in turtles, their nests, eggs, their interest in eating of eggs and turtles, etc

They revealed they have hardly seen any turtles nesting here except for very stray rare occurrence which also never saw the light of the day as it was invariably destroyed by dogs during the nesting period. If at all they did notice a stray nest they invariably would rejoice at the stray occurrence and consume those eggs by sharing among themselves. They stated that they had to consume the eggs immediately as otherwise it would become unfit for consumption. They stated that in this belt it was so rare a phenomenon that they do not remember outright when they last saw or ate the eggs. The children were very responsive and stated that on these rare occasions they would immediately know if anything happened on the beaches in their daily wanderings and search for anything strange or new. Therefore **I concluded that the nesting on this stretch of the beach is not of any significance.**

I inspected the forest and plant occurrence along this stretch including Gilman's RF and found that there is **no evidence of mangrove forests** and they could not possibly occur anywhere here as the ecological factors contributing to its occurrence does not exist. An interesting report was from a person considering himself a knowledgeable person on plants in the area promised to show me some mangroves and landed me into a *'Mango grove'*, making the exercise a futile venture. This fact has been testified from the Forest Range Officer at Visakapatnam who had worked in these areas earlier as a Dy. Ranger and as a Range Officer that no mangroves occur anywhere near Nagamapalem (Gilman's Block) RF. In fact during the discussion with Conservator and one of the Range Officer on the issue of the occurrence of mangroves we were informed of the occurrence of a large patch of Mangroves near the mouth of the river close to Annakapalli to the south of Visak (*which I could not visit*) but photographic evidences were shown of the personal efforts being made to safe-guard and preserve them by the Range officers. These areas are far south of the required areas by the Rare Earths Ltd. However these mangrove areas on the contrary need to be acquired and preserved as a part of the compensation areas as they are either private lands or government revenue lands at present I am told.

I inspected the proposed mining area for the proposed Rare Earth minerals and find that **there is rich deposits in the area**, and in some places the concentration is very high. Such areas are going into the low tide levels. It was explained that Indian Rare Earths Ltd. do not intend going very close to the high tide mark by the Dy. GM. I inquired into

the process of extraction and am convinced that **there are no external chemical involvement** The *process involves a purely mechanical separation* akin to fractional separation using magnetic and electrical inducement for the physical separation of the various minerals As regards the sound disturbances by the machinery to be used I am told it is not as much as the machinery and the high powered pumps being used right besides the coast for the prawn culture Secondly the rate at which sound waves are carried are minimal in these sands as compared to the normal solid rock formations or grounds made up of insitu evolved soil Therefore this process does not seem to me as dangerous as are the large number of prawn culture units located right by the sea-side all along the coast at several places drawing sea water and spilling out the spent fluids which are highly polluted to the coastal ecology We seem to be worried more about the rare phenomenon of a few stray turtles coming to nest, but not bothering about the routine destruction of these waters and coast ecologically destroying so much of the invisible or minute biota whose everyday existence is at threat.

On 26th I visited the areas from Coastal Battery at the Visakapatnam Harbour to Bheemili to make the same series of inquiries starting from Gudlavanipalem, Jodugullapalem, Rishikonda Mangamaripalem, Chappalauppada, and hamlets on the outskirts of Bheemili and at the light house region at Bheemili mostly with the fishermen and there families out of my own curiosity and interest to protect the turtles if they are really in a significant number and need to be protected The findings were similar to that of the previous day right from Jodugullapalem to Bheemili as regards the prawn culture, the occurrence of turtles and their nests, the forest species, etc

On 27th I again visited the areas reported as of great interest by the 'Visaka Society for Prevention of Cruelty to Animals' These area of interest were reported as extending from Jodugullapalem down south upto Pudimadapaka They had shown the various positions where the nests were noticed by them They expressed their concern for protecting the turtles and their inability to do so for want of adequate financial support They spelt out their strategy to protect by appointing a number of volunteers during the season from March-June all along the coast, especially in areas of high intensity nesting This had also been suggested by the volunteer who conducted the survey for WWF-India, APSO, Hyderabad They explained the phenomenon of the receding sea levels commencing from

November-December and reaching the lowest point around April-May exposing the maximum coastal sand surface which become the main nesting sites They suggested the need for translocation of eggs to a safer place as a conservation effort to near Rushikonda Gangavaram or Pudimadaka beaches This is in keeping with Sri Wickeremsinghee a micro-biologist who helped to develop plans for hatcheries in Sri Lanka

On 28th October I had discussions with the forest department and Zoo staff and a number of nature interested school teachers of Visak who had come for the WWF-India Nature Awareness Education programme at the Zoo. Their observations and suggestions for conservation was in line with the recommendations made by WWF volunteer Privadarshini **to safe-guard and concentrate efforts on a few important high intensity areas,** *rather than dissipate the energy and not achieving anything along the entire coast* These observations quote the turtles come at very low intensity of 2-3 nests per kilometer on average, which collaborates with the inquiries I made with the fishermen and their children all along the coast as being a rare occurrence

On 29th I discussed with the Penguin Nature Club members of WWF and they too were very apprehensive of the number and stated their occurrence as very rare and few However they stated that protection of important congregating areas may be considered and their willingness to help in the venture with their 10 year background in Nature Conservation Awareness efforts as shown by their album of events

Conclusions based on the Inspections, Discussions and available Records

1 Ridley is widely distributed in the Tropics of Indo-Pacific and the East Atlantic and is the commonest turtle along the Indian coasts The major nesting beach in India is the Gahirmatha of the Orissa coast

2. Mass nesting of Olive Ridley is a unique social behaviour not reported in other species of sea turtles Sporadic nesting is considered by the fishermen as a freak behaviour or an aberration from normal These are considered as strayed away specimens from the group Therefore these do not merit attention and consideration for specific protection

3 Choudhary quoted only 4 significant "arribada" (mass nesting) beaches in the world Two are on the Pacific coast of Costa Rica, the third of Mexico, while the fourth is on the Indian coast at Gahirmatha in Orissa

4 Jennifer Gamble states in the Readers Digest (July 99) that "Ridleys are the most common, with over one million still surviving It is better to protect turtle nesting grounds,-----It is impractical to preserve long stretches of beaches in poor countries "

5 Choudhary reported **mass nesting** from 2nd February 1994 at 12 noon with 170 turtles increasing to about 5,25,000 (i e over half a million) nests by 13th in the 4 km stretch averaging 1,25,000 per km at Gahirmata as compared to only 280 nests on 4 km at Great Nicobar Island averaging 70 nests per km

On Devi coast about 100 000 nest occurred over 4 km stretch averaging 25,000 nests per km On Akashdia island of the Devi mouth the intensity was estimated at 15,000-22,000 nests averaging 4000-6500 nests per km

Rushikulya mouth on Ganjam coast a new find spread over 6 km had an estimate of 200,000 nests averaging 30-35,000 per km

6 The Chilka coast considered a **poor nesting** area had an intensity of 20-30 nests per km and Puri to Chilka mouth had **sporadic nesting** over 56 km averaging 6-7 nests per km

7 There is local demand for fresh eggs on a small scale in all villages and as a result the few nesting that occur are destroyed Therefore Priyadharsini recommended in her report for protection of high intensity areas by employing locals at Rs 200-300 per month during the season as effective

8 Priyadharsini identified two high intensity areas on the Andhra coast as Kopaskudd (Kaviti Mandal in Srikakulam) and Sacramento Bay Island off Kakinada having 150-300 nests in concentration, while the rest of the coast had 4-5 nests per village which works out to a very low of 2-3 per kilometer on average, often not occuring in most stretches

9 Visaka Society for Preservation of Cruelty to Animals based on a private independent study considered as *good nesting area* at Pudimadaka, Gangavaram and Coastal Battery area of Visak Port with 10, 5, and 37 nests per kilometer The nesting is nowhere compared to Gahirmatha coast and is *less than the normal sporadic nesting areas* of Orissa around Chilka (Therefore Priyadharshini never considered these areas of importance in her report)

10 A very good study on the distance of nesting from the high tide level was done *Nearly 82% of turtles nest from 20'-30' from high tide (summer level)* They stated where

nests are laid beyond 40 feet from shore and no shrubs exist there was death of baby turtles on the way to the sea due to extreme heat on the surface

11 There is **no mangrove species** occurring in these stretches at present These areas are no longer ecologically suited for its occurrence It is reported to occur to the south of Visak as reported and evidence available in a marshy tract

12 There are **no corals** available on the offshore areas in this region and neither are these areas ecologically suited for them

13 The **extraction method** adopted for the minerals is by a physical gravitational separation with electrical and magnetic applications were necessary The resultant 80% discharged sand is unaffected in their physical and chemical properties because of the nature of processing involved for separation No chemicals are involved, unlike in the high intensity prawn culture all along the coast which is being discharged into the sea destroying the local ecology

14 The *machinery to be used* is reported to have lesser sound intensity than the high powered pumps being used by the prawn hatcheries to draw water from the sea as was seen all along the coast at several places The nature of soil does not allow the sound to travel fast and to great distances as the sound gets dissipated faster in these sands, unlike in solid rock or in compact soils

Recommendations based on findings, observation, discussion and literature

With reference to the specific purpose of --

1 Objection raised by AIG, Min of Environment and Forest, New Delhi vide by their letter No 8-89/98-FC dated 11-08-1998 and

2 The recommendations made by Secretary to Govt, EFS & T Dept, GOAP, vide their letter No 13292/For I/97-7 dated 27-2-99 to MOEF New Delhi

I am to state that :--

1 There is no evidence of mangrove forests nor mangrove species nor corals in the vicinity of the area where the proposed mining is contemplated

2 The turtles make their presence as very stray sporadic occurrence along this stretch of the coast and is of no significance Whatever has been occurring is at a very low

level and has rarely contributed to the turtle population as is evident from the inquiry because the eggs are either locally consumed or are destroyed by dogs, etc

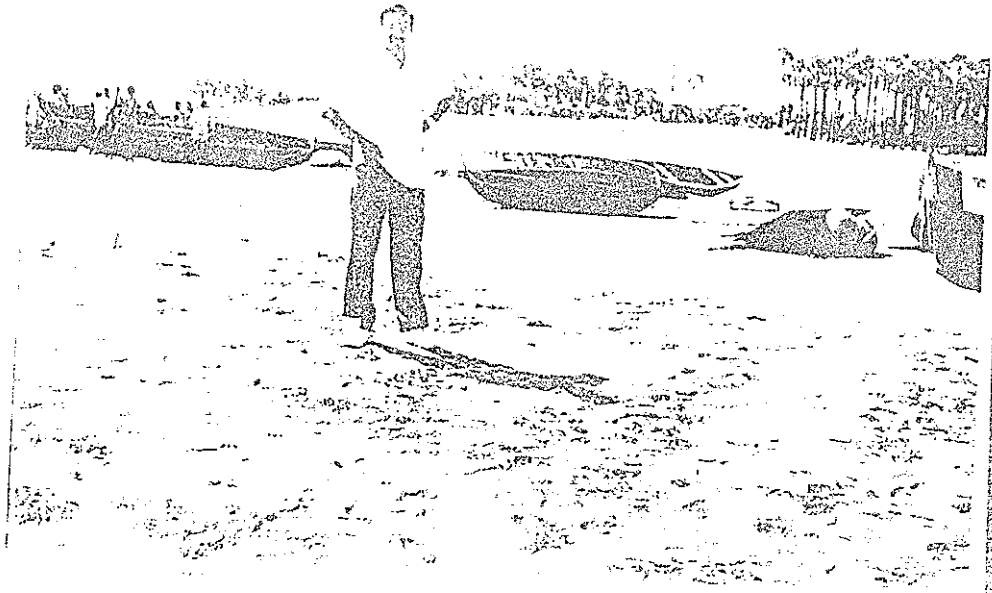
3 There is no need to protect the beach at this region at such high investment of fencing at a distance of 150 meters from high tide mark posting watchmen, stopping work for long stretches of time fearing a disturbance to the turtles nesting which is rare to low sporadic occurrence Firstly turtles nests upto 82% at a distance of between 20'-30 (10 meters) from summer high tide level as reported by an independent voluntary study voluntarily Secondly because sound does not travel far and with speed in these soils as is believed to disturb the nesting *Therefore 15-20 meters from (October-November) high tide level is adequate in these areas*

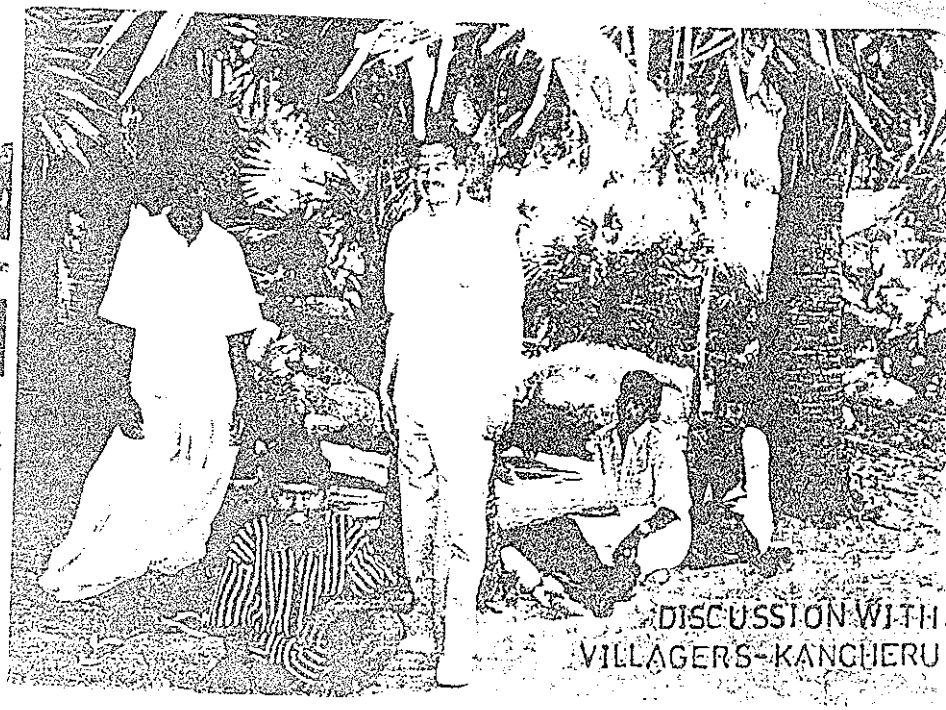
4 There should not be any problem in dumping back the residue which is not polluted by any chemicals which could be harmful to the ecology of the area as in case of prawn hatcheries The *proposal to put back the residue comprising of almost 80% of the original sand (minus the high economic fractions) and restore the original contour should be beneficial accompanied by intensive afforestation* as contemplated This would also benefit as a protective role from natural disasters as experienced in Orissa recently if planted alternatively with palmyra, cashew and casuarina in a determined manner

5 It is suggested that the mine implementing organisation *deposit a small token amount* of Rs. 10.0 lakhs towards Turtle Conservation as *a compensatory act* for the protection of Turtles in the concentration areas as at Kopaskudd (Kaviti Mandal in Srikakulam) and Sacramento Bay Island off Kakinada and also Pudimadaka Gangavaram and Coastal Battery area of Visak, in lieu of the likely loss of a few stray turtles that may venture to the mining area while the mining is in progress *This amount could be deposited with WWF-India as an independent NGO to be kept as a corpus fund*, the interest from it could be used in perpetuity for implementing a turtle conservation, research and awareness creation programmes through select genuine voluntary organisation and volunteers to cooperate and supplement the Wildlife Wing efforts of the Forest Dept

HTL LIMIT IN ML-2

FISHING BOATS USED IN BEACH STRETCH

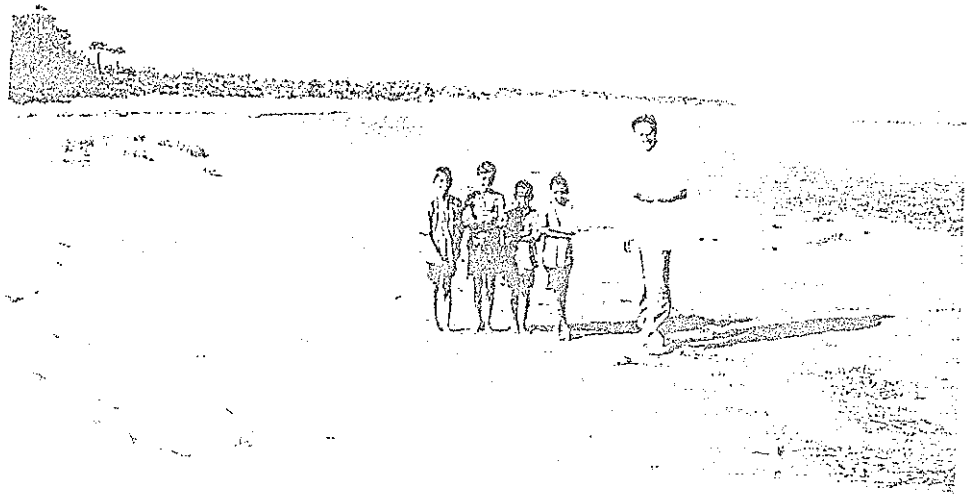


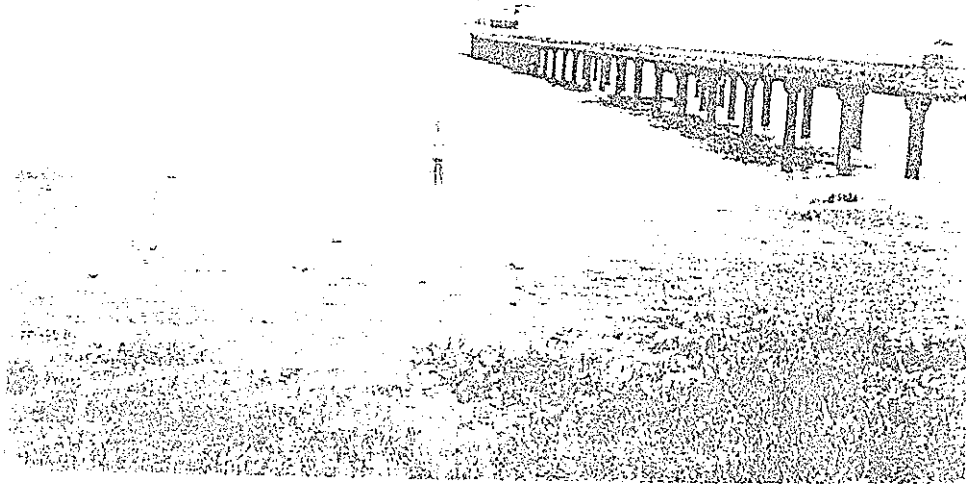


DISCUSSION WITH VILLAGERS-KANCHERU

DISCUSSION WITH VILLAGERS-MUKKAM (V)

ML-3 BIRLA PERICLASE JETTY WITH IN R.F.

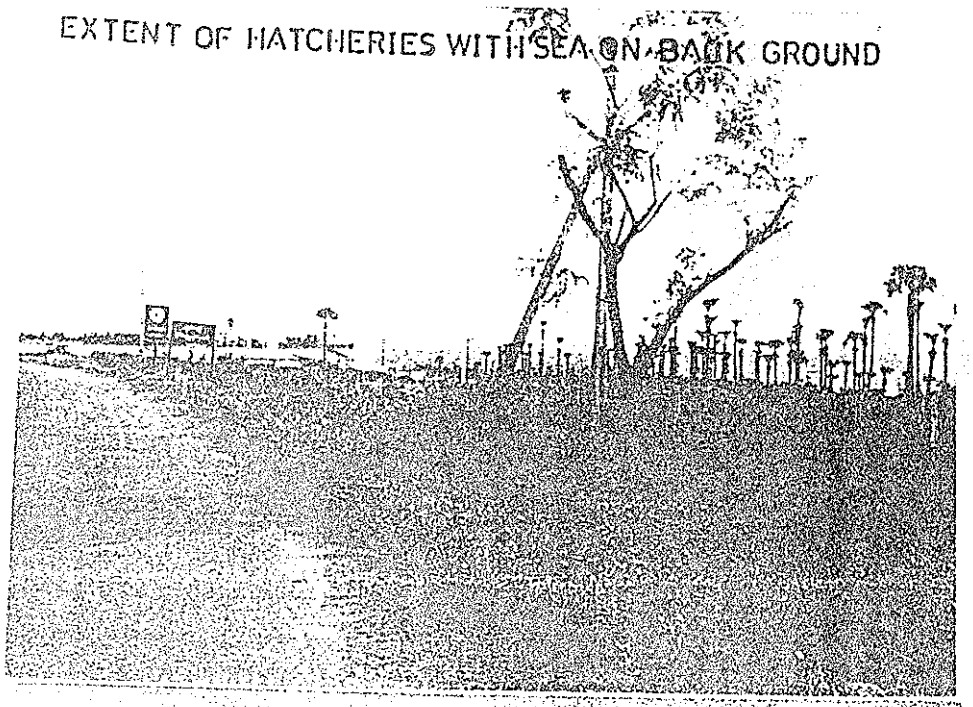


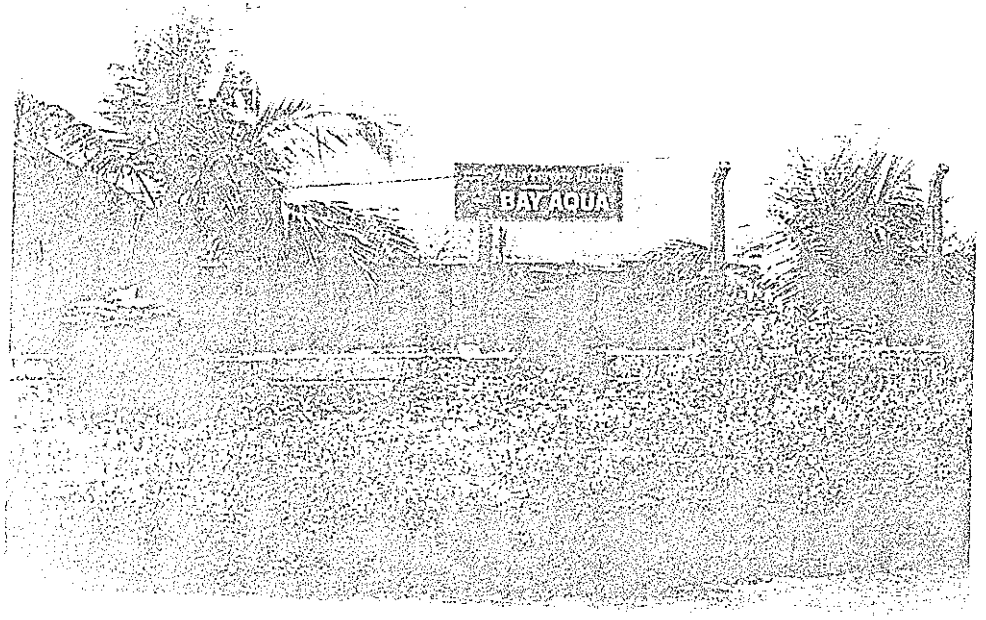


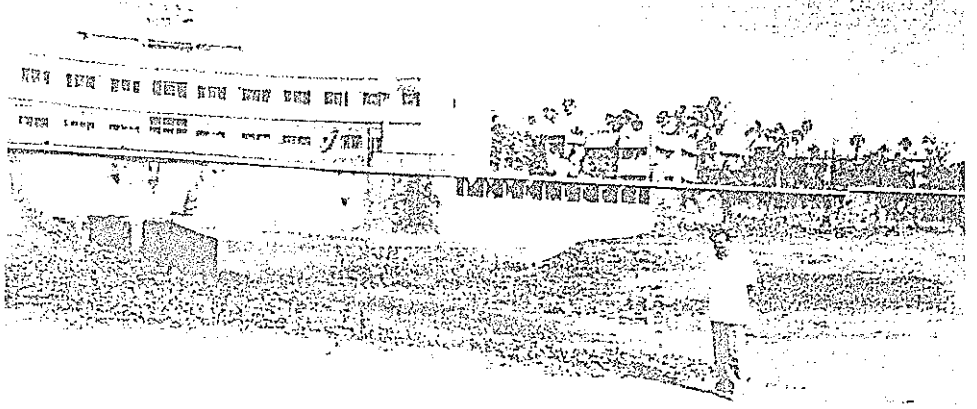
KANCHERU (V)-HATCHERIES IN CRZ-II - M L-4

HATCHERIES NEAR MANGAMARIPETA (V)-WITHIN CRZ-II

EXTENT OF HATCHERIES WITH SEA ON BACK GROUND



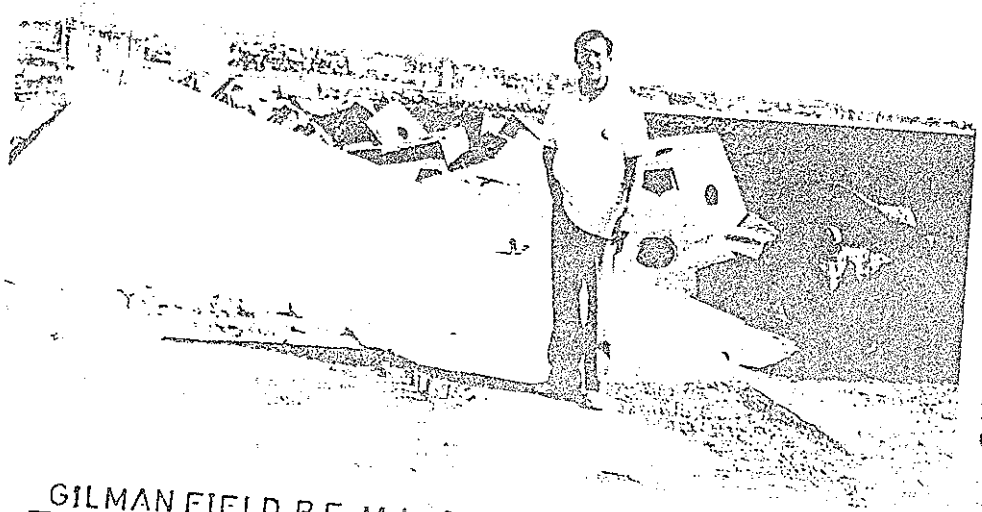




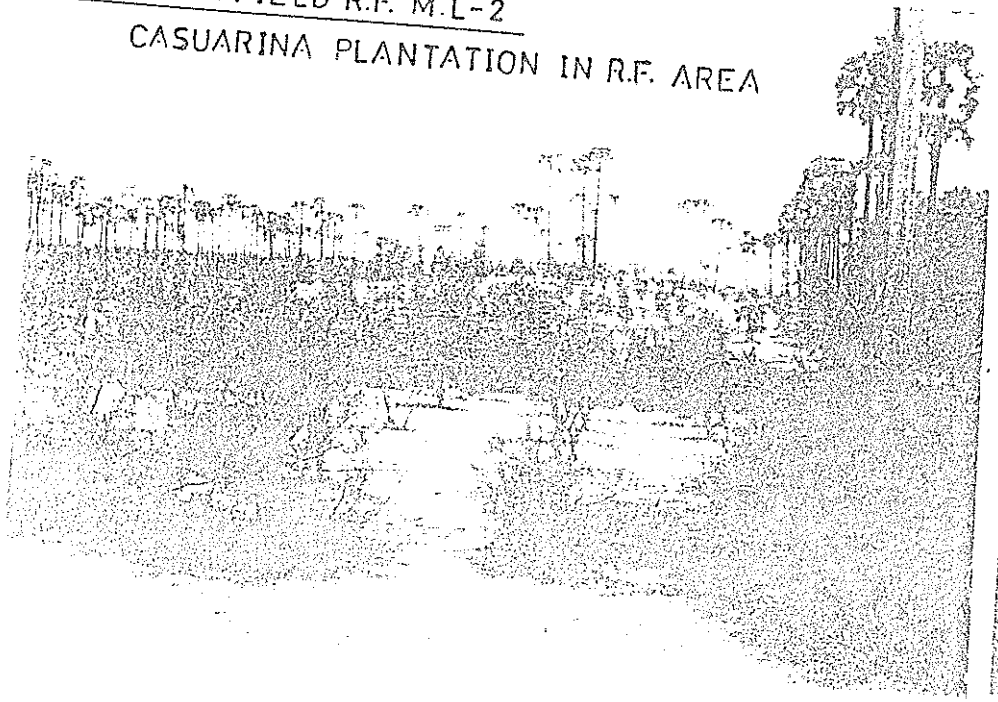
DRAINAGE TO SEA.

RAMA KRISHNA BEACH OPP. OFFICER'S CLUB

PORT AREA COASTAL STRETCH "COASTAL BATTERY"



GILMAN FIELD R.F. M.L-2
CASUARINA PLANTATION IN R.F. AREA



GILMAN FIELD R.F. ML-2
CASHEW & PALM VEGETATION IN R.F. AREA