

Orissa, where there is much polarisation between conservationists and fishers.

In December 2002, all stakeholders in marine fisheries were brought together on a common platform and for the first time, some consensus was arrived at for the use of TEDs through proactive demonstrations, promotion and training (see workshop report, pp. 24). Localised improvement of CIFT-TED was also agreed to based on feedback

from demonstrations to Andhra trawl owners. Though the TED is not widely accepted, at least the conflicting agencies are now willing to share a common platform and to discuss issues in a rational manner. Successful implementation of the TEDs will depend on the involvement of fisheries organizations, who have to come to terms with the fact that it is in their own interest to think seriously of responsible fisheries practices and to consider the welfare of artisanal fishers.

## Implementation of the Turtle Excluder Device in Andhra Pradesh

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The state of Andhra Pradesh (AP) has a coastline of 974 km and fishing is one of the important occupations in this state. Marine waters offer promising scope for all fishers who catch fish both with traditional and mechanized craft. Apart from the target species, the fishermen get by-catch of 50-60%. This by-catch includes low cost fishes, as well as vulnerable and endangered species. The Department of Fisheries, Government of AP is taking precautionary steps to tackle this problem and is implementing the Marine Fisheries Regulation Act as part of its conservation measures. The state observes a closed fishing season from April-May during which period breeding and replenishment occur. There is also a restriction on mesh size to help young fish escape from the cod end, thereby replenishing the fish stock.

The Department of Fisheries has recently taken up the protection of sea turtles. Olive ridley turtles (*Lepidochelys olivacea*) are endangered, and protected under Schedule 1 of the Indian Wild Life (Protection) Act, 1972. There is incidental mortality of olive ridleys in trawl nets, particularly along the northern AP coast. The State Institute of Fisheries Technology (SIFT), Kakinada, which is a training institute in the Department of Fisheries, AP launched a programme in August 2001 (with the support of the Wildlife Institute of India, Dehradun) to prevent the incidental mortality of sea turtles in trawl nets along the coast of AP. The following were the main tasks to be undertaken by SIFT, Kakinada:

- ◆ To conduct a two day workshop
- ◆ To demonstrate the operation of TED in AP
- ◆ To train & encourage fishermen to use TEDs
- ◆ To educate fishers on sea turtle conservation
- ◆ To serve as a state-wide information centre on turtle conservation

As part of this programme, SIFT, Kakinada has conducted awareness camps, surveys, workshops, and TED demonstrations in different coastal districts of Andhra Pradesh.

### Awareness camps

A pre-nesting awareness camp was held during October & November 2001 in coastal districts to communicate the need for conserving sea turtles. In the awareness camps, the faculty of SIFT, Kakinada emphasized the necessity for the use of TEDs. It was also explained that the Government had issued orders to use TED in trawl nets. The fabrication, functioning and assembling of TED were demonstrated.

**Table 1:** Awareness camps, 2001 – 02

District	No of villages	No. of Participants
Srikakulam	7	525
Vizianagaram	3	340
Visakhapatnam	5	615
East Godavari	7	720

During the nesting season i.e. January and February 2003, the SIFT conducted awareness camps exclusively in the coastal villages of northern Andhra Pradesh.

**Table 2:** Awareness camps, 2002 – 03

District	No. of Villages	No. of Participants
Srikakulam	2	1980
Vizianagaram	9	690
Visakhapatnam	10	730
East Godavari	14	2460

A mass awareness programme was launched canvassing the need for turtle protection in the fishing villages where *Teku vala* (nets used to catch rays) is in operation. The fishermen themselves agreed to stop operation of these nets during the nesting season. An egg protection committee was formed involving the community in this area to protect turtle eggs from stray dogs, jackals and other threats.

### Survey

Brief surveys were conducted in December 2001 and December, 2002 to February, 2003 in East Godavari, Visakhapatnam, Vizianagaram, and Srikakulam Districts to document the occurrence and causes of incidental mortality of turtles. Several deaths were caused by the operation of *Teku vala*, commonly used in Vizianagaram and Srikakulam districts for

catching rays. The use of these nets coincides with the peak nesting season of turtles in these areas.

**Table 3:** Turtle mortality documentation

Name of the villages	No of carapaces	Cause of death
<b><u>East Godavari District</u></b>		
Kakinada Harbour	7	Trawl gear
Subbampeta	7	Trawl gear
Mayapatnam	7	Trawl gear
Christupuram	2	Trawl gear
Konapapeta	3	Trawl gear
Chodipallipeta	6	Trawl gear
Addaripeta	10	Trawl gear
Hope island	19	Trawl gear/ Seed nets
<b><u>Visakhapatnam District</u></b>		
Palman Peta	6	Ray net
Dibba palem	8	Ray net
Thikkavanipalem	6	Ray net
Vizag, Beach	2	Trawl net
Vizianagaram dist		
Pedakancheru	18	Ray net
Chintapalli	4	Ray net
Srikakulam Dist		
Manchi neella peta	9	Ray net
K. Matsyalesam	28	Ray net
Kapasakuddi	3	Ray net

### TED Demonstration

The TED designed by Central Institute of Fisheries Technology (CIFT), Kochi was fitted in the nets of Andhra Pradesh fishing trawlers to demonstrate its use. During the demonstrations, 270 free TEDs were distributed to fishers in Vishakapatnam (162) and Kakinada (108). These are currently in use. Fishermen unaware of TEDs were encouraged to use this device and informed that it has been made compulsory in shrimp trawling. A necessary amendment to this effect has been made in the AP Marine Fisheries Regulation Act, with a fine of Rs.2,500/- besides confiscation of entire catch for

non-compliance. Several demonstrations were organized to show that the reduction in catch with the use of TEDs is minimal. This was demonstrated using an extra cod end attached to the escape hatch during trials. From the foregoing demonstrations, it is observed that the percentage of escape of fish/shrimp range from 0.5% to 3.3%. In one or two occasions, the escape rate is slightly higher and this may have been due to a large quantity of jellyfish that entered the net. The results of the different demonstrations taken up by the SIFT, Kakinada are given below (Table 4).

**Table 4: TED Demonstration Results**

Boat No	KKD 1234	KKD 1219	KKD 1021	KKD 1030	NZM 343	NZM 12	KKD 1030	KKD 1021	VSP 506	VSP 836	MRP 020	VDR NEW	KKD 1030	KKD1 030	KKD1 021
Depth of operation (m)	30	30	30	30	36	36	35	30	40	40	20	25	30	32	33
Towing Speed (knots)	2	2	2	2	4	4	4	4	4	4	4	4	4	2	2
Towing Period (h)	1.5	1.5	1.5	1.5	1	1	1	1	1.5	1.5	1	1	3	3	3
No of Hauls	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Catch in Cod end (Kg)	35	30	15	25	20	15	18	10	6	7	15	10	60	18	21
Catch in Cover net (Kg)	0.5	0.3	0.2	0.4	0.1	0.15	0.3	0.1	0.05	0.15	0.5	0.2	2	0.7	0.8
% Escapement	1.43	1	1.33	1.6	0.5	1	1.66	1	0.8	2.1	3.3	2	3.3	3.6	3.5
% Retention of target catch	98.6	99.0	98.7	98.4	99.5	99.0	98.3	99.0	99.2	97.8	96.7	98.0	96.7	96.4	96.5

### Workshop

A two-day workshop on the operation of TEDs was conducted by the Department of Fisheries at Kakinada on 24<sup>th</sup> & 25<sup>th</sup> January 2002. On the first day of the workshop, a demonstration was organized on the use of TED in trawl nets. It was observed that the loss of shrimp catch by the use of TED was negligible during these trials. On the second day of the workshop, a number of issues were discussed and the participants made several recommendations. These recommendations were categorized into three sections, as given below.

### Recommendations

Though several recommendations were made, the most important ones are mentioned below:

### **Protection, Enforcement & Regulation:**

- ◆ Interdepartmental co-ordination among concerned departments i.e. fisheries and forest departments, research institutes, fishermen and NGOs is critical
- ◆ Reclamation of beaches and protection of nesting beaches should be taken up by the AP Forest Department.
- ◆ Illumination of nesting beaches by aquaculture hatcheries should be lessened during nesting season.
- ◆ Strict implementation of the use of TEDs in shrimp trawling, as prescribed in the AP Marine Fishing Regulation Act.

### **Monitoring, Research & Evaluation:**

- ◆ The use of TEDs by fishing trawlers has to be monitored at sea
- ◆ Nesting zones along the entire AP coastline to be surveyed for nesting and incidental mortality; on land by the AP Forest Department and at sea by the AP Fisheries Department.
- ◆ Ongoing research on TED technology to suit the needs of local fishing.
- ◆ Research on TED designs to be explored by CIFT, Kochi. Periodic trials with new designs of TED to be experimented in order to check its efficiency.
- ◆ TED information centre of SIFT to act as nodal monitoring and information centre. Training to faculty of SIFT on conservation of sea turtles and on design of TEDs.

### **Community Based Conservation:**

- ◆ SIFT should play a vital role in increasing awareness and co-ordination among all the stakeholders including NGOs, fishers and Forest Department.
- ◆ For popularisation of TEDs at all the leading fishing harbours of AP, it is necessary to safeguard the interests of fishers.
- ◆ Regional level workshops on a small scale may be organised for a better understanding about conservation of sea turtles.
- ◆ Forest department officials should take ample interest to see that volunteers of *Vana Samrakshana Samithi* (Forest Welfare Group) also cater to the interests of turtle conservation.

- ◆ Formation of turtle clubs at village level
- ◆ Awareness among fisher children regarding conservation can be initiated at school level onwards by arranging competitions like debate, painting and poster making.

After the workshop was completed, the enthusiasm it generated among the public has influenced the Fisheries Department to take up more demonstration programmes in various coastal districts to educate the fishers about the use of TEDs in their trawls.

#### Interactions with trawl operators

The demonstrations and workshops helped to convince the fishers to some extent that the TED is no longer a bane to them and instead may be a boon to sea turtle conservation. Some of the fishermen suggested that there should be some refinements in the TED. Some of the suggestions were that:

- ◆ The space between spokes may be increased
- ◆ Weight of the TED may be reduced

The SIFT, Kakinada has been in touch with the concerned organisations, in particular CIFT, Kochi, to attend to these issues.

#### TED Demonstration Centre

A TED Demonstration cum Information Centre was established in SIFT, Kakinada where the fishers, public and officers of various allied departments will be constantly motivated on the need to protect marine turtles. Hand-outs were prepared and distributed on various occasions like awareness programmes, and other local events in coastal villages. Posters highlighting the urgency to save turtles were affixed in villages at important places and at fishing harbours and made available to all. Youth fishers undergoing a one year training programme at SIFT were also educated and trained on the use of TED during their fishing trips. We plan to conduct awareness camps during pre-nesting periods in all coastal villages with audio-visual aids and results of last year's data. Furthermore, demos at all important mechanized landing centres to create awareness on the use of TED are also planned. Apart from this, we propose to conduct refresher training programmes at SIFT for all coastal fisheries staff. Thus the Department of Fisheries is taking all necessary measures to safeguard the marine turtles of Andhra Pradesh, in collaboration with the Wildlife Institute of India

## **CIFT – TED: Construction, Installation and Operation**

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Due to harvesting of sea turtles and their eggs and their accidental mortality associated with shrimp trawling and other fishing operations, turtles have been threatened with extinction in all parts of the world. The incidental catch of marine turtles is reported to occur particularly along the east coast of India. Researchers have developed a Turtle Excluder Device (TED) that greatly reduces incidental death of sea turtles in shrimp nets. TEDs were introduced in US shrimp trawling operations in 1980s. A TED is a frame consisting of a grid of bars installed before the cod end of the trawl net at an angle leading upward and downward to an escape slit. Small animals such as shrimp, slip through the bars

and are retained in the cod end, while large animals, such as turtles, large fishes and large elasmobranchs are stopped by the grid bars and can escape through the opening. Experience has shown that the use of TEDs when combined with other elements of an integrated turtle conservation, can stop the decline in sea turtle population and will, over a period of time, lead to their recovery.

Shrimp is the major foreign exchange earner contributing to over 70% of the marine products export earnings. Shrimp trawling is currently the most valuable fishing system in India, in terms of the export earnings and domestic supply for fish.