

ian Fishermen. This is a remarkably high rate of return and shows the willingness of local fishermen to assist. So far the longest time between release and recapture of a tuna has been three and a half months. In this time ONE particular fish had travelled all the way down to Addu (the southernmost atoll in the Maldives archipelago) from Male', a distance of about 500km.

STOP PRESS

There was a period of strong westerly winds between the 01st of August (see table 5 below) until the time of going to press (10th of August). This may continue to counteract any movement of sand caused by the period of strong east north easterly winds reported in December 1989 (see the *March Newsletter - Ed*).

TABLE 5. WIND-SPEED AND DIRECTION (AUGUST 01 - 10).

Daily and three hourly wind-speed in knots (average all directions) and dominant wind direction for August 01st - 10th 1990 for Hulule supplied by the Maldives Meteorology Office.

DAY	DAILY AVERAGE	WIND DIRECTION AND SPEED DAILY AND 3 HOURLY AVERAGE (UTC)								
		3 HOURLY								
		0000	0300	0600	0900	1200	1500	1800	2100	
01st	NW 19	NW 18	NW 18	NW 18	W 20	NW 20	WNW 20	WNW 20	WNW 20	
02nd	WNW 19	WNW 18	WNW 17	WNW 20	WNW 20	WNW 20	WNW 20	WNW 18	WNW 18	
03rd	NW 18	WNW 20	NW 18	NW 18	WNW 15	NW 20	NW 15	WNW 20	NW 16	
04th	NW 18	NW 17	NW 18	NW 17	NW 18	NW 18	NW 19	NW 18	NW 18	
05th	NW 21	NW 20	NW 23	NW 20	NW 23	WNW 23	WNW 22	WNW 20	NW 16	
06th	W 20	WNW 22	W 20	W 20	W 27	W 18	W 16	W 17	W 17	
07th	W 18	W 18	W 18	W 15	WNW 21	W 20	W 19	W 18	W 15	
08th	WNW 18	W 18	W 18	NNW 33	WNW 18	WNW 14	WNW 15	WNW 13	WNW 15	
09th	W 17	W 18	WNW 15	W 15	W 15	W 25	W 20	W 17	WNW 14	
10th	W 16	WNW 13	W 18	W 19	W 20	W 18	W 16	W 12	W 14	

REG. No: 354

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COT NEWS LETTER



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MARINE RESEARCH SECTION
 MINISTRY OF FISHERIES AND AGRICULTURE
 The Republic of Maldives

EDITORIAL

ECO-TOURISM

In Eco-tourism the client pays to experience a close and harmonious association with the natural environment. Whether or not there is a market for 'Eco-tourism' remains to be seen. Even the greening western tourist is still not prepared to pay more for this sort of holiday.

The greening tourist is prepared to make a choice in favour of a destination that has a healthier environment. It also makes good sense to operate tourism in Maldives on an environmentally friendly basis since the islands and associated reefs are very sensitive to environmental misuse. Resort islands will have to stay healthy whether they are to be handed back to the Maldivian people or they are to continue earning revenue from Tourism.

What allows the Maldives to market a holiday under the 'Eco-tourism' label? It certainly needs an appropriate environment, and the reefs and palm fringed coral sand islands of the Maldives are perfect. It also requires a commitment to meet certain environmental standards and responsibilities.

The Republic is still a developing country so this means that developing and implementing a full range of standards is likely to be a relatively flexible and long-term process. However, this is no excuse for inaction. The example and pace should be set from the very beginning.

The Government is committed to the wise husbandry of the natural resources of the Maldives. Eco-tourism can be a source of pride to the people of Maldives and a source of continuing pleasure to visitors.

The Government has to start somewhere. Issues such as waste disposal and diver damage are complex and require sophisticated solutions. Solutions to these problems also require a change in attitude by many Resorts that will take time and education. Some Resorts are already becoming involved in the process. All too many still have to do

so. The various programmes such as monitoring the reefs for 'COT', introducing 'REEF FISH SAMPLING', and 'ADOPT A CORAL' are designed to encourage a change in attitude. It will not be an easy task but we are ready to try.

COT QUESTIONNAIRE

A certain representative of a large travel agency was surprised at the large number of Resorts that had failed to respond to the COT questionnaire sent out last March. The list of Resorts that have failed to respond continues to dwindle but remains large.

Table 1. COT QUESTIONNAIRE RETURNS JUNE/JULY 1990

ATOLL	RESORT	HOUSE REEF	
		COT SEEN/DAY	CONDITION
N. Male'	Makunudhu	100-999	Deteriorating
S. Male'	Rannalhi	0	Healthy
Ari	Gangehi	0	Healthy

Almost half the Resorts have still not replied. They are:-

Alimatha, Ari Beach, Asdhu, Baros, Bathala, Boduhithi, Club. Med., Cocoa Island, Dhigiri, Ellaidoo, Embudhu Finolhu, Embudhu Village, Gasfinolhu, Giraavaru, Halaveli, Hudhuveli, Kadooma, Kudahithi, Kunfunadhoo, Kuredhdhu, Lankanfinolhu, Leisure Island, Little Hura, Madoogali, Meerufenfushi, Nika Hotel, Olhuveli, Vaadhu, Velassarau, Velidhu, Ziyaaraifushi.

Why is this? It may seem silly to let us know that you don't have a problem with COT but shouldn't you be looking and checking and reporting... after all it will, at least, mean that you are keeping an eye-out for other problems.

REEF FISH SAMPLING

Three years ago we tried to introduce a reef fish sampling programme on Resort islands. Three Resorts made an effort to help. In February we tried again with an official re-

quest from Government for assistance. In the April COT newsletter we repeated the request for assistance in reef fish sampling and repeated the justification:-

"An assessment of the state of the marine environment includes an assessment of the state of the reef fisheries. This requires that reef fish landings are sampled and catch composition is analysed. If reef fisheries are not researched and monitored then they may deteriorate to a point at which they are no longer useful as a source of food for resorts. Even more food will then have to be imported from overseas. This will adversely effect resort profitability, the livelihood of reef fishermen, and the quality of a holiday in the Maldives."

Only sixteen resorts have made a commitment to the programme (*we have been extremely generous in interpreting some responses as a commitment - Ed*). The Resorts that wish to help are:-

Table 2. RESORTS WILLING TO HELP ON THE REEF FISH SAMPLING PROGRAMME.

ATOLL	RESORT
North Male'	Hembadu Hudhuveli Ihuru Kanifinolhu Lohifushi Nakatchafushi Vabbinfaru
South Male'	Biyadhoo/Villivaru Embudhu Village Rannalli Rihivelli
Ari	Angaga Ari Beach Mirih Maayafushi

Three Resorts; Kurumba, Fesdu, and Dhigiri, have given reasons why they cannot help. By far the majority of Resorts have not even replied. Yes we appreciate that you might have problems that prevent you from helping but why not let us know?

ADOPT A CORAL

The 'ADOPT A CORAL' scheme was introduced with a leaflet in the May newsletter. There are several reasons for developing the programme:-

- To celebrate the beauty of Maldivian coral reefs in the 25th year of Independence.
- To act as a catalyst for increasing environmental concern about the marine environment amongst Maldivians and visiting tourists.
- To monitor the health of the marine environment.

Only three Resorts, Villivaru/Biyadhoo, Rihivelli, and Club Med, have returned completed forms so far. What of the rest?

CHANGING ATTITUDES

It will take time to change attitudes in the Resorts. Perhaps one day they will be the ones calling for a better environment and chasing the Government to implement greater environmental safeguards. In the meantime we see the seeds of a better attitude in the letters sent by some concerned Resort Managers and at least the attitude of the rest is indifferent rather than negative.

NEWS FROM RESORTS - REEFS

The editorial points out the poor response from Resorts to the 'COT' questionnaire and the 'Adopt a coral' programme. We hope to have more news in the coming months. In the meantime we haven't heard reports of any problems so we hope that 'no news' means 'good news'.

NAKATCHAFUSHI

Husain Rasheed continues to struggle with the problem of COT at Nakatchafushi. They stopped collecting COT off the house reef in May because of bad weather and started again on June 08th. They collected 1806 COT in June and 3988 COT in July. The maximum

collected in any one day was 272 and the minimum was 33. There is no evidence that the numbers of COT being collected are falling though there has been no repeat of the 1392 COT collected on the 01st of March.

MAKUNUDU

Philippe says that the COT come and go which is why he doesn't send Resort staff to collect them everyday. 250 COT were collected in the whole of July whilst 150 COT were collected in one day on the 11th August. This is much less than the 1,000 plus COT collected each day on three days in April and May.... though the problem is far from over.

VABBINFARU

Vabbinfaru collected 33 COT off their house reef on one day in July. We counted 24 COT in a one hour snorkle along the west side of the house reef on the 09th of August. This compares with 11 COT seen in the same area on the 23rd of May.

NEWS FROM RESORTS - BEACH EROSION

There have been strong westerly winds over the past few days (see 'STOP PRESS'). Hopefully this will continue to move sand back to where it was eroded from last December. We plan another survey trip to selected Resort Islands in October to see how things are going and will report on our findings later in the year.

NEWS FROM LOCAL ISLANDS

We plan a three week survey trip to selected atolls and islands to the south of Male' towards the end of August. We hope to add to the three local islands that are presently sending us completed reef fish sampling forms. We might even 'ADOPT A CORAL' or two. We will also be looking at the state of the beaches and house reefs of selected islands and keeping an eye-out for COT.

We may not be able to re-visit the 80 reefs surveyed for COT in 1987 and 1988 but we hope to visit a few of them. As it is the survey showed that few reefs have COT and that these are mainly in the northwest of North Male' atoll and in parts of Ari atoll. A summary of the results of the survey are given in table 3 below.

Table 3. INCIDENCE OF COT AT 80 SITES IN 8 ATOLLS DURING 1987 AND 1988.

ATOLL	NUMBER OF SITES	SITES COT SEEN	NUMBER OF COT SEEN/HR
North Male'	26	2	2,27
South Male'	8	1	2
Ari	13	1	6
Vaav	6	0	0
Faaf	5	1	4
Dhaal	16	0	0
Meem	3	0	0
Thaa	3	0	0
Total	80	5	-

BEACH NOURISHMENT

(Continuing the story from the June newsletter - Ed.)

SOURCES OF SAND

The best source of sand is one that has the same structure and composition as beach sand. Only use sand from the beach if you are sure that you are returning it to its' starting point.

If you have any doubts about this use another source. The next best source is one that has no interaction with your island or with any other island. This means a source as far from any beach as possible so that the sand from the beach does not slip into the excavated hole! The more sand that is being moved the further away this should be (see fig. 1-3 opposite).

One good source of sand is a sand scree slope. These scree form on the lee side of the atoll rim where the water deepens into the lagoon or down the reef slope at a natural gap in the house reef. But be careful. If the sand scree

Fig. 1 EFFECT OF TAKING SAND FROM A STABLE UPPER BEACH.

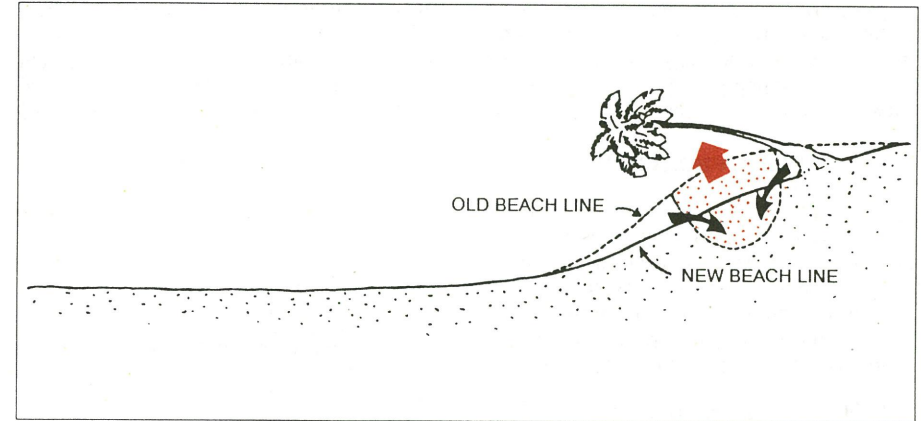


Fig. 2 EFFECT OF TAKING SAND FROM A STABLE LOWER BEACH.

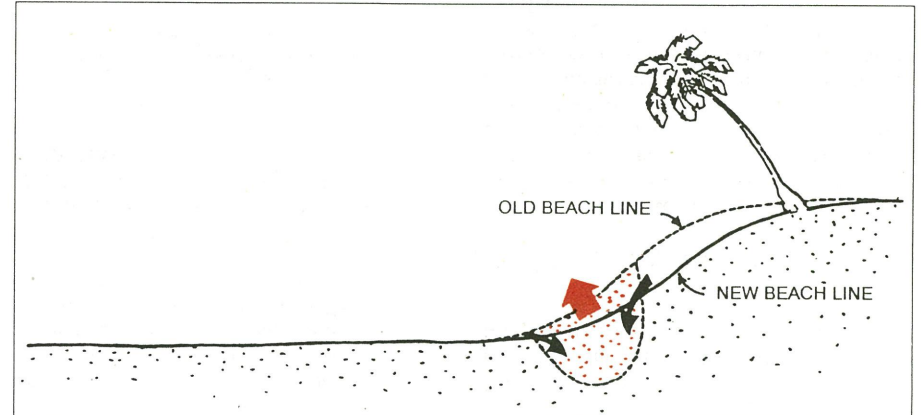
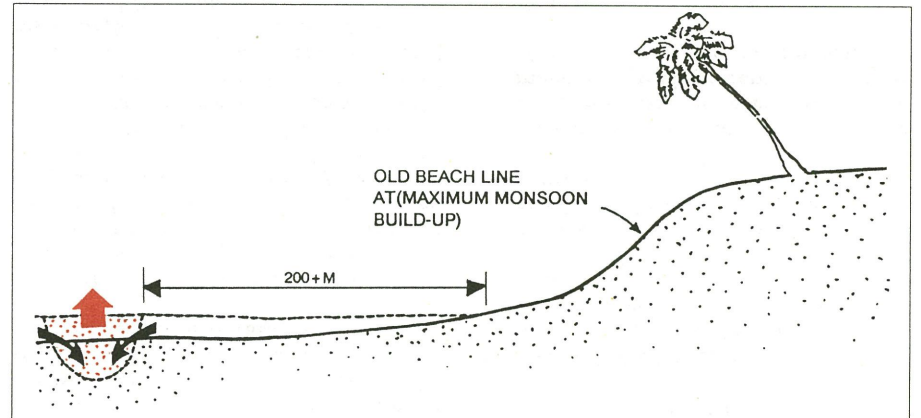


Fig. 3 EFFECT OF TAKING SAND FROM THE FAR LAGOON.



is connected to a beach removing sand may undermine the beach (fig. 4 opposite).

Incidentally it was a recommendation of a recent report on problems of beach erosion in Addu Atoll that Government should, where possible, identify 'safe' deposits of sand in all atolls and limit sand collection to these sites. The report identified several suitable sites in Addu Atoll.

MOVING THE SAND TO THE BEACH

Sand can be transported wet as a seawater slurry that is pumped through pipes, in a dry form (in bags), or in combination. Slurry pumping is most effective for transporting large quantities for short distances (the piping and pumps are expensive). The opposite goes for dry transport. An intermediate level system would be an airlift pump (the sort used in marine archaeology to take sand off a wreck) in combination with a barge. In all cases the material needs to be screened to remove particles that are too big or small (fig. 5 opposite).

HOW MUCH SAND SHOULD YOU ADD?

A rule of thumb is to add at least 5m³ to every metre of shoreline that has eroded back by 1 metre and then see what happens. If it doesn't work the prevailing conditions may not be right and the method should be reviewed. If it does work then it should not be turned into a land-creation exercise. In most cases the basic island shape is controlled by relatively strong forces. To keep additional sand in place will require more and more effort. You will end up keeping it there using breakwaters or seawalls at great cost and probably with little real success. Also remember that you should...

**NEVER
NOURISH A BEACH
TO THE REEF**

....(see Fig. 3 in the June Newsletter - Ed).

HOW WE CAN HELP

If you need some advice on any problems of beach erosion you are facing write and let us know. We may be able to help. If you try to do the work without help you may make the problems worse.

NEWS ABOUT CORAL REEF MONITORING

The Canadian team (see *Coral Reef Training Programme in the July Issue - Ed*) have now set-up 6 reef monitoring sites.

Table 4. ICOD REEF MONITORING SITES.

Atoll	Location
N. Male'	Male' Anchorage Male' NE of Bandos Villingili
S. Male'	Embudhu Village SE of Vaadhu

The aim is to monitor changes in the reefs and the water quality at these sites and to train local staff to carry-on the programme in the future. Some additional surveys are also being done for comparison. If you have a site that you feel should be monitored then let us know at MRS.

NEWS ABOUT TUNA

TUNA TAGGING

Fisheries are currently the most important sector of the Maldivian economy and most of the fish caught are tuna. Marine Research Section, with assistance from IPTP (Indo-Pacific Tuna Programme), has been tagging tuna around the Maldives for the last six months to find out their migration patterns and so determine how they might best be managed.

As of 14th June 1990 4028 tuna had been tagged and 398 had been returned by Maldiv-

Fig. 4 USING A SAND SCREE SLOPE AS A SOURCE OF SAND

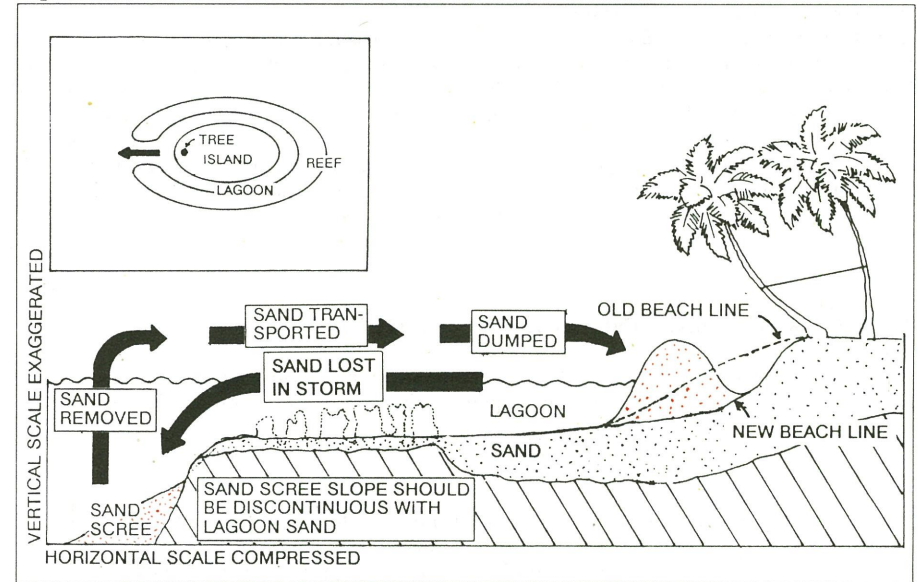


Fig. 5 MOVING SAND TO THE BEACH

