

# NEWSLETTER

**Coral Component**  
Wetland Conservation and  
Coral Reef Management Project



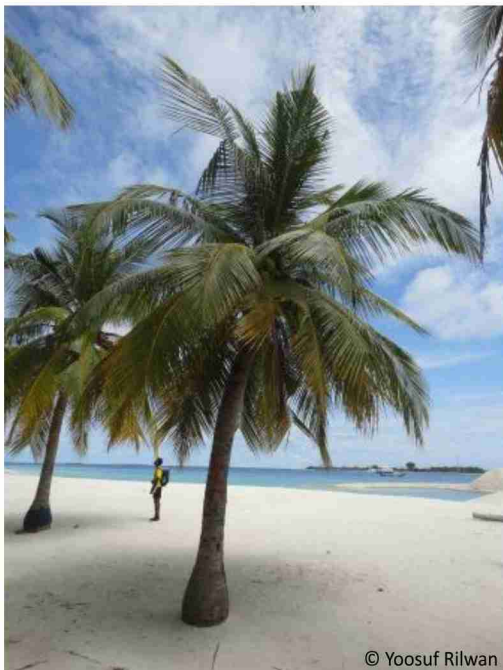
## PROJECT ADVISORS NOTE

Dr Dawson Shepherd is the technical advisor for the WCCM Project.

Why bother to monitor coral reefs and the goods and services that they provide?

The WCCM Project aims to provide 5 resorts in north and south Male' Atolls with the tools to monitor the condition of the coral reefs and the social and economic goods and services that they get from coral reefs. This investment is justified on the basis that the people who benefit from coral reef based goods and services should make a greater contribution to monitoring and managing them. It is hoped that the monitoring will be the pilot for a national coral reef monitoring system.

From 1986 to 1992 I travelled widely in the Maldives with Maldivian colleagues looking at the condition of the coral reefs. Between 1990 and 1992, 16 editions of a COT (crown of thorns starfish) newsletter were produced with the Marine Research Section (now the Marine Research Centre of the Ministry of Fisheries and Agriculture). The newsletters indicate that the

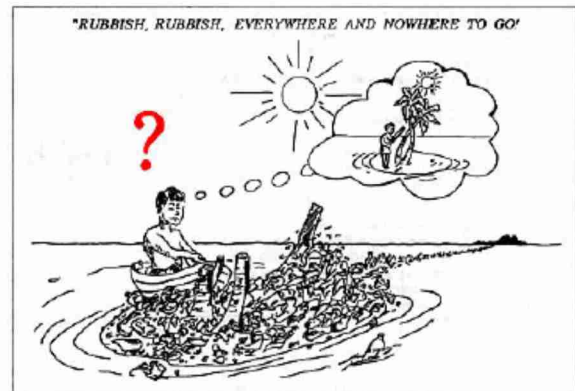


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environmental situation in Maldives was not particularly rosy even in those days. Coral mining had destroyed many of the house-reef flats. There was significant die-off of reefs from crown of thorns starfish plagues. Solid waste was

a big problem. Beach erosion, seawalls, groynes, solid jetties and breakwaters were widespread. Some resorts reported infestations of insects and die-back of vegetation.

### COT Newsletter of November 1991 - January 1992



I returned to Maldives in 2009 after a 16 year absence. As far as I know there are no COT plagues, perhaps because there is less coral for the COT to eat. Solid waste and beach erosion continue to be reported as big problems. Whilst reefs are recovering from the major bleaching event in 1998 they still have to return to their past glory. However, despite problems the tourists are still coming. The fish are still in the market. Life goes on.

It can be argued that the monitoring surveys of the last 25 years have made little difference to the Maldives environment. A prevalent attitude is that this is because nothing can be done to solve the problems that have been identified. So why bother to monitor?

Of course there is little practical benefit from monitoring if we can do nothing with the information that has been collected. However, human activities created the ozone hole, released the greenhouse gasses that are fuelling climate change, mined the reefs, produced the solid waste, and built the infrastructure that is threatened by erosion. So if we are capable of creating the problems we should be capable of solving them.

So why monitor? We monitor to provide information with which to help us solve problems.



# INTRODUCTION TO THE MONITORING PROTOCOLS OF THE WCCM PROJECT.

An international consultancy firm was hired by the project to peer review the proposed protocols. They proposed 14 protocols for the WCCM project. In this issue of the newsletter, I will look at the 7 protocols and hopefully on the next issue I will look into the remaining protocols.

## 1. Air and water quality

Air Water Quality protocol is designed to collect information on air quality and the rate of marine sedimentation and associated issues with water quality. This information can then be used in association with information from other protocols to investigate cause-effect relationships between management interventions and maintenance of environmental quality. Understanding how environmental change, whether from 'natural' events and/or management interventions can impact environmental quality and over what periods is important in the planning of such operations whilst not disrupting resort operations.

## 2. Catch and Effort

Catch and Effort protocol is designed to determine whether fish (vertebrate and invertebrate) populations that are exploited are fished sustainably. In theory a fish population has a maximum sustainable yield (MSY) and if over exploited the catch will fall and the effort rise (it will be harder to catch the fish as they become rarer). Participation by resorts will help ensure that marine resources are used sustainably, which is very important to the viability of the Maldives tourist industry.

## 3. Eco system assets

Ecosystem Assets protocol is designed to determine the extent to which renewable natural assets such as coral reefs and coral reef fisheries give an economic (financial) return. Such a return can then be used to determine the importance of these assets in maintaining the viability of the Maldives tourist industry, to justify investing in maintaining this return and/or seeking compensation for the loss of this return.

## 4. Impact and management

Impact and Management protocol is designed to determine the location and nature of impacts and the management actions taken to reduce these impacts. Repeat surveys can be used to determine whether, or not, the proposed management actions have been delivered and have reduced the observed impact so increasing opportunity for accountability.

## 5. Life forms bottom transect

Monitoring of coral reef species will help resorts to monitor their local marine environmental status and quality, which are important aspects for the sustainability of the tourist experience.

## 6. Life forms extended swim

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## 7. Life forms marine turtle

Marine Turtle Status is designed to involve resorts in monitoring turtle sightings, tracks and nests. This Protocol will assist resorts with their beach management and avoid any potential conflicts with turtle nesting.



## THE PROJECT UPDATE

The WCCM project had been on the move since the release of the last newsletter in June. Since then the project had been working very closely with the Lim Geomatics from Canada in developing the web enabled data system. The project advisor, coordinator and the project owners had several discussions via email and Skype in developing the web enabled data system.



The work of web enabled data system is on track and will be done for the training in November. A team from Lim Geomatics will be in the Maldives to train the resorts and the participating ministries once it's done and is ready for testing.

The other major event which is under way is the selection of a party to train the resorts. The bids



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for the training of the resorts were opened internationally and from these a party had been selected. They will be signing their contract within September. The idea is to begin the training of the resorts on data collection after the training on web enabled data system is completed. Since the involvement of the resorts will start once the initial stages of the project is completed the participating resorts might feel that the project is not on track. But it is on track and the training of the resorts will begin at the end of this year.

Procurement and purchase of equipment and materials that is required for monitoring at the resorts is also currently on going and will be ready to handover to the selected resort in time for the completion of web enabled database and baseline data collection date scheduled under training agency contract.

## REEF FISHERY IN THE MALDIVES AND TOURISM

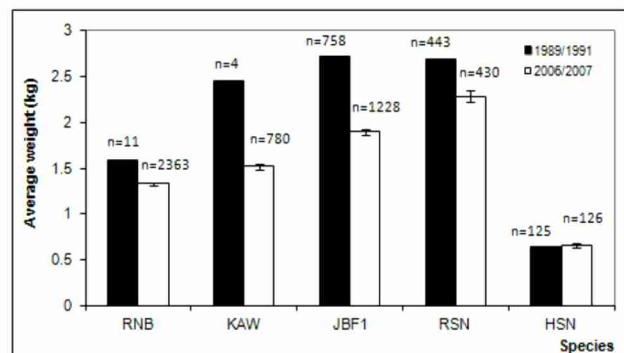
This article had been written by referring to Shahaama Adul Sattar's report for Marine Research Center.

The main type of fishery conducted in the Maldives is tuna fishery using pole and line and hand line. When the Tourism industry opened in the Maldives a huge demand opened for the reef related fishes and invertebrates. Tourism industry since then had been growing and there are more than 90 resorts in the Maldives at the moment.

The main consumers of reef fish are tourists. To estimate the total catch and consumption rates normalized by occupancy rates and total number

of beds on an annual basis, tourist resorts were surveyed in 2006 and 2007 via a questionnaire which was sent to all resorts through the tourism ministry. Approximately 20% of operational resorts responded to the questionnaire and provided their reef fish purchase records, while only one resort provided details of their occupancy rates. We initially requested reef fish purchase quantities and prices on a species level and on a daily basis. However, most resorts pay a set price per kilo of reef fish regardless of the species composition. As a result, available records only show aggregate reef fish purchase. Data obtained from this survey were used to estimate average prices and revenues for fishers as well as normalized consumption rates. Results from this survey were generalized to all resorts.

Since 20% of the 90 Maldivian resorts contacted replied to our survey questionnaire on reef fish purchase records, while resort occupancy rates were received from only one resort. Extrapolation based on one resort's reef fish purchase for the whole year of 2006, its occupancy rate for 2006 and its number of beds, indicates that for each tourist night, an average of 1.29 kg of fish (whole fish, not cleaned or filleted) was purchased by the resort. The total number of registered beds in all resorts and hotels in Maldives for the year 2006 was 18,407 (MoTCA, 2007) and the average occupancy rate was 81.8% (MoTCA, 2007). Therefore for a total 5,495,778 tourist nights, the quantity of reef fish purchased by all resorts in 2006 would have been approximately 7100 metric tonnes. This is more than 3 times the amount (i.e. 2064 tonnes) purchased by all resorts in 1988 (Anderson *et al.*, 1992).



**Figure 1.** Comparison of average weight of main species caught in the current fishery with observations made during the 1989/1991 survey (HSN – Humpback snapper, RNB – Rainbow runner, KAW – Kawakawa, JBF1 – Green Jobfish, RSN – Red snapper). Error bars are standard error. The 1989/1991 data are estimated using all fishing gear types.

To manage reef fishery careful planning and management of fishery resources on an atoll



basis will be needed shortly to account for other factors than current fishermen practices. For this, a robust long-term fishery monitoring and management program designed by atoll with varying environmental features and varying fishing pressure as well as varying management measures such as no-take zones and protected spawning aggregations would be needed in parallel to the monitoring of the quality of reef and lagoon habitats possibly damaged after bleaching events and other disturbances. Inter-atoll variations need to be taken into account if future monitoring is done by considering the different rates of tourism development and the latitudinal environmental and geomorphological variations found across Maldives (Anderson *et al.*, 1992). Monitoring of reef fish catch should be planned in coordination with the resorts. This can be enforced by making recording of their reef fish purchase (including details such as species

and quantity purchased, date of purchase, fishermen details, size and weight) an obligatory criterion for obtaining their license to operate. Proactive actions by the resorts themselves should be encouraged. For instance, one resort has its own regulations and did not purchase individuals smaller than a certain size or if they were immature, or did not purchase any fish at all if sharks were found on board even if caught accidentally. Species-specific regulations should also be further promoted at first signs of stock degradation since there are no management regulations for reef food fish except for the declaration of the Napoleon wrasse (*Cheilinus undulatus*) as a protected species and the export ban on all species of parrotfish. This would complement current regulations and guidelines existing for the aquarium trade fishery and the bait fishery.



**Contact detail:**

Yoosuf Rilwan, Liason Officer  
Coral Reef Monitoring Project, Climate Change Trust Fund,  
Marine Research Centre, Ministry of Fisheries and Agriculture,  
Male' Rep of Maldives.  
Tel: (+960)3322242  
mobile: (+960)7791202  
email: coralcomponent@mrc.gov.mv