



## Handle With Care

In the vast sprawl of island nations which exist in the Pacific Ocean, welfare depends to a great extent on marine resources. Traditionally, fisheries have provided a major part of the staple food of the islands, as well as employment and income, both for individual families and for the national economy as a whole.

With increased population pressure leading people to struggle for a share of valuable inshore species, resources have declined dramatically. Also, such overfishing sometimes involves destructive methods, which not only reduce the abundance of the next generation of sea life, but which also destroy the very locations that will support future catches.

The status of the inshore fisheries sector in many island nations is not what it used to be, and this heralds a warning with regard to the future livelihoods of the villagers. Since few substantial alternatives for employment exist in many of the remote islands, which are untouched by the tourist industry, the downward trend in the fisheries could upset whole societies.

In fact, fisheries might not be the right term for the multi-faceted utilisation of marine resources which occurs in the South Pacific. Pearl oysters, sea cucumbers, and corals are just a few of the species harvested in the coastal waters of the islands.

The WorldFish Center has taken a strong interest in improving the lives of coastal people in the Pacific Islands. It has opened a research station in the Solomon Islands, mainly supported by Australian and New Zealand funds and scientific institutions. Together, these partners developed a range of projects which

could be used to test what could be done to improve the situation there. They were, of course, looking for activities which might be of general interest to a number of islands.

Some key recommendations have come out of these joint studies and the planning undertaken, such as a recognition of the need to restore biological marine life and to create additional employment for villagers. These translate as: "we must protect the fishing grounds to some degree and make sure that fishing is done more carefully, not destroying its own base in the process." And "we must take some of the fishing pressure away and look for additional income opportunities: new ventures should build on resources already available there and should be based on the skills of the fishers." And, "we must make sure that all aspects of these new initiatives can work well in practice."

The first pilot schemes were initiated in the mid 1980s. Very quickly the scientists realised that this would involve a development effort, and would utilise all their skills, and even some that they did not know they possessed—skills which they were definitely not taught in university.

The 'academic' part of the Pacific programme, which has run for many years, has itself been demanding. It has involved studies of how marine life in the area responds to protection from fishing, and research to discover whether Marine Protected Areas (MPAs) could be used to replenish stocks in surrounding areas. Some species have recovered pretty swiftly: for others it looks like it will take decades to build their numbers up to a healthy level. The jury is still out, however, on whether these pockets of protected

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species can supply enough juveniles to support increased harvests in nearby fisheries.

Another vital component of the project was gaining an understanding of the reproductive cycle and the conditions required for growth of those species that are not well described in scientific literature but which are now becoming important. These species include Giant –and spectacular–clams, blacklip oysters and sea cucumbers. The new insights gained were used to design experiments to find out how best to grow these sea animals in secluded environments on the coast. Had the purpose of the project been to grow these organisms in aquaria in laboratories, life would have been easy. But here the challenge was to make things work using available technology, and at a cost that the villagers could manage.

The programme is still a 'work in progress'. But achievements have been made. These include the lucrative production of black pearls, based on the transfer and adaptation of technology from the Eastern to the Western Pacific. The project has also helped develop environmentally friendly catches of colourful tropical fish and 'coral farms', which often involve village women, and which

are all good export items for the aquarium industry. So whilst, originally, the production methods were not available, and had to be developed by the WorldFish Center and its partners, now the way has been made clear for private enterprises to gradually link all the elements together.

The policy advice given regarding the protection of resources and additional employment options has influenced not only the small number of countries directly involved in the programme. Other countries and regional organisations are now taking an active interest in the programme, and are participating in scientific discussions on how aquaculture and restocking can be used to increase the productivity of their valuable inshore resources.

Many of the island nations have had their marine resources staff trained through the programme.

A very encouraging new development resulting from this work is the fact that the Secretariat of the Pacific Community have decided to make the programme a priority activity, while still having the WorldFish Center play the role of a partner. We have definitely not seen the end of this story.



*M. McCoy*



## Reefs At Your Fingertips

It is the dream of any scuba diver to float through the wonderland of a tropical coral reef, marvelling at the abundant, varied and colourful fish that swim against a background of silently swaying coral colonies. The richness is obvious to all—whether they have been there or have just enjoyed the sight on their television screens. Marine biologists will confirm this impression. The coral reefs, in Southeast Asian waters alone, contain over 600 of the 800 coral species which build reefs, and are home to tens of thousands of species of fish, molluscs and crustaceans. A centre of tropical ocean richness or, as scientists would say, marine biodiversity.

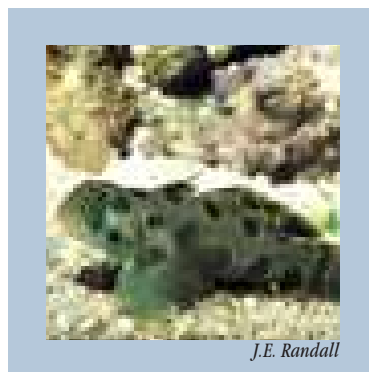
But this is more than a tourist's underwater game park. Out here begins the marine food chain that feeds so much of the life in the tropical oceans. This food chain provides food, employment, income and environmental protection for millions of people who live on the vast coastlands and on the islands of the region.

Paradise, one might think. But a paradise which is being lost. Because here people are destroying the harmony which existed—out of ignorance, greed, neglect or, most probably, in their daily fight for survival. There is a real danger that this crucial source of life will be destroyed.

Coral reefs are extremely vulnerable. They can very quickly be destroyed but require a long time to rebuild themselves. Their survival is a question of balance. Although corals are found in all

oceans, they only build reefs in a narrow belt of tropical water, because this requires the right mixture of water quality, temperature and biological life.

Human activities upset that balance, or even destroy the reefs. In recent years, a frightening number of coral reefs have turned white—'bleaching' is the specialist term—and died as a result of rising water temperatures. This is, in all likelihood, an early consequence of global warming, with the delicate coral reefs working as a very sensitive indicator.



*J.E. Randall*

Because its researchers are very worried about this situation, the WorldFish Center began, back in the 1980s, to compile facts and figures relating to coral reefs globally. Based on state-of-the-art information technology, a computer database (ReefBase) was constructed. Originally this was simply a database which contained only information that might be found in the

Center's own research reports, as well as relevant literature and statistics from laboratories and organisations all over the world, and documentation provided by the Center's many partner institutions.

But, with improved IT options, during the late 1990s the WorldFish Center developed a website which gradually replaced the earlier CD version of the database. This new medium has all the advantages of an interactive search facility as well as a virtually unlimited capacity for data and links.

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Because it was created by a research institution, the website is very special. Of course, it will be consulted by scientists, since it keeps them up to date with all the relevant academic news from their field. But ReefBase is unique, because it also provides access to a lot of 'grey' literature, which is otherwise not recorded. And, not least, because it cuts and pastes information from more than 12,000 references—which you would otherwise have had to read from cover to cover. In fact, more than 500 of these documents are available as full texts, downloadable with a click of your mouse. Perhaps even more importantly, those managers and decision-makers responsible for the care of coral reefs can find information—tailor-made for them—which caters to their needs, and can be updated swiftly.

Taking a look at the superstructure of the website, you will see how different it is from a purely academic website. So, some of the keywords given for coral reefs are 'status', 'threats', 'management', 'data' and 'photos', which you can use to find information from around the globe, for certain regions, specifically for your country or even for an individual reef.

With satellite maps provided by ReefBase and Geographic Information Systems (GIS) technology, with the latest recordings

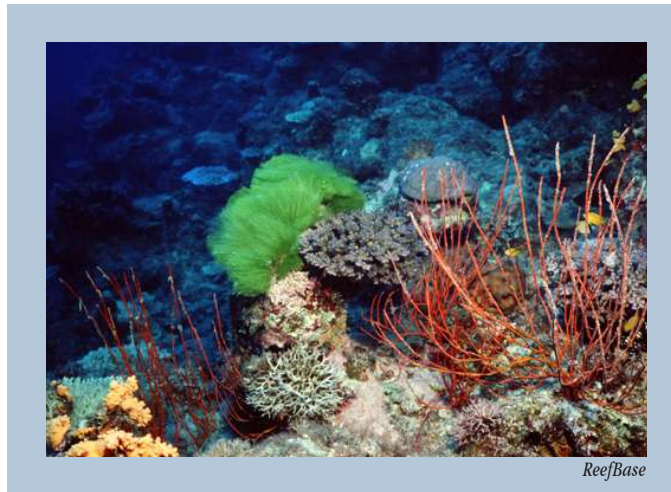
of all aspects of human activity around the reefs, as well as information about protected areas and trends in environmental status, you can produce comprehensive documents for fisheries authorities or one-pagers with key indicators for your minister.

The success of the much-visited ReefBase WebPages is due, largely, to collaboration between an extensive list of

national and international organisations—the 'who's who' in coral reef research and management. These include the United Nations Environment Programme (UNEP) World Conservation Monitoring Centre in Cambridge, the World Resources Institute in Washington D.C., National Oceanic and Atmospheric Administration (USA), the Global Coral Reef Monitoring Network, and

UNEP Regional Seas Programs. The list is endless. Most key collaborators are also members of the International Coral Reef Action Network, which is supported by the UN Foundation.

If the health of the underwater paradise that is the world's reefs is maintained and, hopefully, improved over the coming years, thanks should go to [www.ReefBase.org](http://www.ReefBase.org). Visit the page one day and see it for yourself.





## Sharing Their Insights

A few chilling facts from the warm coastal waters of South and Southeast Asia: first, there are far fewer fish around than there used to be. In most countries, stocks are down to between 10 per cent and 30 per cent of their original, unfished levels. Second, an intensification of the activities of fisheries in previous years has led to the ongoing 'mining' of fish. For example, in the Philippines, fishing levels are 30 per cent higher than the coastal waters can support. Third, there used to be a very varied selection of fish in the coastal waters of South and Southeast Asia, but with all the fishers going for the most valuable species, the numbers of these fish are going down fast. So, even if the fisheries use ever-more sophisticated equipment—and in that way more or less keep up the total of their catches—the fish taken are generally smaller and of less popular species, while the fishing cost per captured ton increases year by year.

These facts are not exactly hot news, some of them being drawn from a regional study that published its results some time ago. The WorldFish Center has been working on these tropical fisheries problems since its start. But, in many ways, the countries behind the figures are still behaving as if these

numbers are a total surprise. Still, with the new tools that are at hand they could change their routines, institutions and policies. Indeed, most are in the middle of such a process of change.



*D. Lever*

Those in the know have, of course, been worried about the situation for quite some time. So, in 1996, the WorldFish Center organised a workshop for scientists involved in coastal fisheries from Bangladesh, Indonesia, Malaysia, the Philippines, Sri Lanka, Thailand and Vietnam. Here they took stock of national information and experiences and came up with an abundance of reference information from studies over several decades.

Each country had, over many years, compiled statistics from their coastal waters using what the specialists call 'trawl surveys'. These were not really intended to record the details of stock

development, but were rather meant to enable the governments to advise their fishers on where to look for the richest catches in a particular season. But the statistics they had gathered could now be used by the scientists as a much needed baseline. What is more, it was obvious that the figures were not relevant only to each particular country: they represented regional trends.

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The funding for the workshop came from the Asian Development Bank, who also financed the recommended follow-up project for the region: 'Sustainable Management of Coastal Fish Stocks in Asia'. This project, co-ordinated and documented by the WorldFish Center, included India as an additional partner.

Between 1997 and 2001, the combined inputs from the countries involved in the project led to the creation of an invaluable management instrument: the Fisheries Resource Information Systems and Tools. FiRST does not only contain trawl survey figures on fish stocks. It also provides social and economic data on the 10 million people involved in the fishing industry in the region, as well as information about their varied activities, from village netting to fishing fleet operations.

The eight countries involved in the project provided documentation explaining their fisheries management systems, and their practical experiences. The way these systems worked in practice was evaluated and the systems were compared. That alone has been an inspiration and a solid base for better

national planning and management of fisheries resources, because lessons have been learned from the successful practices and solutions arrived at elsewhere. And, not least, the project has encouraged people to take a critical look at the workings of the fisheries institutions, in light of the fact that they had been created to maximise fish catches

rather than to promote the sustainable use of coastal waters.

The countries involved are all much the wiser at the end of the project. And their staff are better qualified to use their new insights and tools as a result of the extended training programmes offered by the project, which involved more than 70 people.



*D. Lever*

It took a lot of confidence-building before every country would contribute their fishery statistics, which some years earlier might have been almost 'Top Secret' information. With growing mutual trust, the next logical steps will be for politicians to decide on joint regional—or bilateral—action to share not only figures, but also brave new initiatives in the interest of the region's common fisheries resources.