Shrimp fishery discards slashed

– in global by-catch program

A FAR-REACHING project funded by the Global Environment Facility (GEF), an independent financial organisation that provides project grants to developing countries, has been instrumental in reducing by-catches in shrimp fisheries by between 30 and 70%.

The project Reduction of Environmental Impact from Tropical Shrimp Trawling, through the Introduction of By-catch Reduction Technologies and Change of Management is a truly international effort that is running across South America, Asia and Africa.

In Asia, the project involves Indonesia and the Philippines, plus the intergovernmental organisation SEAFDEC. Gulf states Bahrain and Iran are involved, as are Cameroon and Nigeria in Africa.

Further west, Colombia, Cuba, Costa Rica, Mexico, Trinidad & Tobago and Venezuela have all seen benefits of reducing by-catches in their shrimp fisheries.

Improved trawls have been tested in almost all of these countries, resulting in lower catches of non-target species as well as savings in time and money due to lower fuel costs and improved catch quality.

"It is no secret that fishing has become an area of enormous international concern with many stocks being fished unsustainably," I'm told by Monique Barbut, new chief executive officer of the GEF which was established by governments.

"Far too many young fish of target and non-target species are being caught before they can mature. Worldwide losses, as a result of juvenile fish failing to reach marketable maturity, are thought to run into billions of dollars a year.

"Currently over 60% of what is caught in the global shrimp fishery is discarded, making it among the most environmentally damaging in the world."

This initiative – now in its fourth year – could be a blueprint for better use of the world's finite natural resources, according to Achim Steiner, United Nations under secretary general.

He is also the executive director of the UN Environment Programme (UNEP) which is co-ordinating the $9 million project executed by the UN Food and Agriculture Organisation (FAO).

"There are important lessons to be learnt here for other fisheries and, indeed, across a wide range of environmental challenges from forestry to energy. Creative management, technological improvements and a willingness by a wide range of partners to embrace new ideas can deliver significant improvements towards the sustainable use of economically and biologically important resources," he comments.

Left: a grid rigged at the correct angle of 45-50°.

Far left: this grid was rigged to an angle of around 25°, which resulted in substantial loss of shrimp.

FAO guidance

FAO has been assisting shrimp fishermen, artisanal fishermen and regional fisheries organisations to introduce different by-catch reduction technologies, taking into account specific environmental conditions and the interests of participating countries.

Different countries are moving at different speeds. However, preliminary results of the initiative, scheduled for completion in 2008, are now beginning to emerge in several of the participating nations, according to FAO information.

Some of the best results are coming from Mexico, where more than 2000 shrimpers operate off the Pacific and Gulf of Mexico coasts. Work carried out has included fitting research vessels with sensors to monitor the effectiveness of the new trawls and methods, while commercial shrimp trawlers are equipped with new-design fishing gears.

"The new technologies are accepted by fishermen and 140 vessels are using the new gears voluntarily," I'm told.

According to the latest FAO progress report: "Preliminary results show by-catch reduction of 30 to 60%... a reduction in fuel consumption and a 20% increase in the shrimp catch."

"Due to improvements in shrimp quality and catches, durability of the trawls as well as fuel consumption reductions, fishermen are very keen to use the new prototypes. The number of vessels that use the new designs, materials and fish eye are increasing," it adds.

Promising results are also emerging in Colombia, where the shrimp fleet numbers some 100 vessels, many working in the Caribbean. Here, fishermen have been testing three new trawl designs also fitted with by-catch reduction devices.

Preliminary results indicate that unwanted by-catch can be reduced by over one-fifth, with fuel consumption cut by a similar amount.

Trials in the Philippines have focused on boat owners and fishermen operating in the major shrimp fishing areas in Lingayen Gulf, Manila Bay, San Miguel Bay and Calbayog City in the Samar Sea.

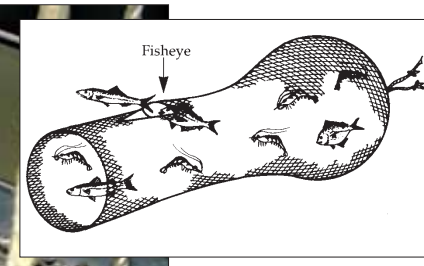
This project is being carried out in collaboration with the

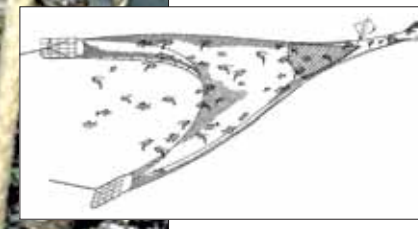
Left: the large filtering area of the TED shown reduces the risk of shrimp loss. This grid also has a large escape opening to exclude large animals form the gear.

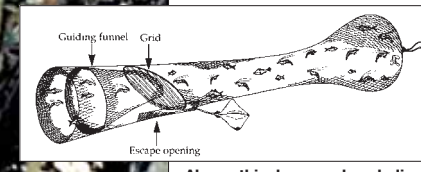
Centre: the by-catch from this shrimp trawl haul includes numerous non-target fish as well as a turtle.

Far left: by-catches taken in shrimp trawls can often include large animals such as this shark, plus a great deal of small fish.

A striking illustration of the difference a selectivity device can make. The fish in the box on the left is from a trawl with a grid, while the trawl that caught the fish in the box on the right was not fitted with any selectivity device.







Above: this downward-excluding 'hard' TED is made with a rigid oval grid.

Above centre: the Morrison TED is an example of a 'soft' TED which uses a panel of inclined netting instead of a rigid grid to steer by-catch out of the gear.

Top: a fisheye is a simple, low-cost and easily handled by-catch reduction device (BRD), as it allows fish to swim forward to escape from the gear. The downsides are that it does not allow large animals to escape and positioning the fisheye in the right place is critical. Too far forward and fish will not locate it, too far back and shrimp loss can occur – especially in bad weather.

Left: this NATFED grid, designed by the Australian Maritime College, is a rectangular grid using bent bars to minimise the risk of sponges and other objects catching against the bars. The bar spacing here is 60 mm so as to exclude large jellyfish.

Left: this tombstone-shaped grid is a compromise between oval and rectangular grid shapes. The canvas sheet seen here is to help animals escape from the gear more quickly.

Southeast Asian Fisheries Development Center (SEAFDEC).

Preliminary results, using three types of By-catch Reduction Devices (BRDs), show cuts in unwanted fish of between 33 and almost 70%.

"This technology has the potential to reduce our catch of juveniles and other small fish, and I can only laud the efforts to involve us in activities like this and enable us to appreciate and see for ourselves its benefits," says Marisa Lakindanum, owner-operator of six shrimp trawlers.

"In return, what I can offer is our co-operation and to do our share to protect and sustain our fish resources."

Mel Senen Sarmiento, mayor of Calbayog City who is supporting the implementation of the project in the local trawl fleet in the Samar Sea, adds: "This technology can help us not only to continue fishing but, also, ensure that there is always enough fish for the local populace alongside livelihoods and income for fishermen."

Mexican fishermen and researchers have been active in Venezuela helping artisanal fishermen on Lake Maracaibo, where by-catches amount to 14,000 or more tonnes of discarded fish annually, or an estimated 72% of the total catch.

Assistance includes training in using a suripera type of net to replace the beach seine gears currently in use.

There has been progress with artisanal vessels from Venezuela and Trinidad & Tobago fishing in the Orinoco Delta in using fish eye devices to allow fish to escape while shrimp remain in the net.

This is a fairly simple device, with a framed opening in the top of the codend that fish need to swim forward to make their way out of. This device has already shown that it can reduce the catch of fish by around half with minimal loss of the target species.

Now get the handbook

THE BOOK of the project entitled *A Guide to By-catch Reduction in Tropical Shrimp-Trawl Fisheries* is available from FAO. A second print run of the English-language version is being prepared after the first printing was distributed to fishermen and others around the world.

An Arabic version has been produced and versions in French and Spanish are also being prepared. The book can also be downloaded as a pdf document from the FAO website. Go to www.fao.org/fi/gefshrimp.htm> and click on the link, open and save.

The book, written by former shrimp fisherman Steve Eayrs of the Australian Maritime College, sets out definitions of by-catch (estimated at seven million tonnes worldwide annually) and the reasons for reducing it.

Then the book moves on to cover an array of Turtle Excluder Devices (TEDs) and By-catch Reduction Devices (BRDs), as well as Juvenile and Trash Excluder Devices (JTEDs).

This book is liberally illustrated with both photos and diagrams – and Steve Eayrs kindly supplied all of the pictures used with this article.

His book is accessible and straightforward, describing in detail the different types of TEDs and BRDs – from simple square mesh to several complex devices – and how to make them, plus some frequently asked questions and troubleshooting guides.

In addition to the discussion of different methods and the detailed technical data sheets included in the book, it is likely that the most useful thing will be the practical pointers in avoiding mistakes.

These can include 'over-tuning' TEDs, relocating a fisheye and generally optimising gear for best performance.

Nigeria's ticket to export

FAO project co-ordinator Thomas Moth-Poulsen reports that trials and research in participating countries are well under way.

He says: "Nigeria is trying to achieve recertification for exports to the US market with the American inspectors visiting Nigeria in September." By-catches of turtles in shrimp fisheries are a barrier to access to the important US shrimp market which otherwise embargoes imports from these fisheries.

"This is in connection with a series of theoretical and practical workshops that have been conducted to facilitate the implementation of TEDs by our co-ordinator James Ogbonna and our research leader Dr. Bolu Solarin in Nigeria.

"The Nigerian fishing industry has been very active and helpful in the development of both TEDs and BRDs. Neighbouring Cameroon is following this development carefully and also aims for export certification," Thomas Moth-Poulsen tells *FNI*.