

# Policy reform and community-based programmes to combat cyanide fishing in Philippines<sup>1</sup>

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Prepared for the expert consultation on: *Closing the loop: Natural resource-management oriented agricultural research and policy change*. European Centre for Development Policy Management, Maastricht, The Netherlands, 10–11 November 1997

## 1. Cyanide fishing: A poison tide on the reef

Since the 1960s, more than a million kg of deadly sodium cyanide have been squirted onto coral reefs in the Philippines to stun and capture ornamental aquarium fish destined for the pet shops and aquariums of Europe and North America. More recently a growing demand for larger reef food fish has vastly increased the incidence and spread of cyanide fishing. Chinese consumers in Hong Kong and other major Asian cities greatly value certain reef fish when they are plucked live from a tank, cooked, and served minutes later, and pay up to US\$ 300 per plate for some species. The combined demand for aquarium and live food fish has spread cyanide fishing throughout Indonesia and into neighbouring countries such as Papua New Guinea, Vietnam, the Maldives and Fiji. In the past year, officials in countries as far-flung as Eritrea, the Marshall Islands, and Tanzania have voiced suspicions that their fast-growing live-fish export industries may also be using cyanide.

Far from Hong Kong's restaurants and the pet stores of Europe and North America, fishermen in South-East Asia, the Indian Ocean, and the Pacific dive into the sea with 'hookah' tubes in their mouths—attached to air compressors on small boats—and makeshift squirt-bottles in their hands. These fishermen squirt cyanide into coral formations, thereby stunning and collecting their prey. Sometimes a crowbar is necessary to pry apart the coral heads and reach the stunned fish that hide in crevices. The rewards are high, with some cyanide divers making more money than the university professors in their countries, but so are the risks.

Untrained in diving safety, many fishermen fall prey to decompression sickness ('the bends') Contributing to this chain of poison are a variety of intermediaries—vessel and holding-tank facility owners, fish exporters and importers—and civilian, police, and military officials who look the other way for a cut of the profits.

Cyanide kills corals and reef invertebrates along with many non-target fish. Large percentages of the fish that are captured live die in transit, due to their poison-weakened state. Deadly in any marine environment, the spread of cyanide fishing is particularly tragic in the countries of the Indo-Pacific. As the global centre of marine biodiversity for corals, fish, molluscs, and reef invertebrates, the region may justifiably be called 'the Amazon of the Oceans'. Cyanide fishing also threatens the livelihood of poor coastal people in the region, where dependence on fish protein is very high and fisheries provide millions with income.

The Philippines, birthplace of cyanide fishing, is also the only country with a programme in place to eradicate the practice. Since the early 1990s, the Bureau of Fisheries and Aquatic Resources and the International Marineline Alliance–Philippines (IMA), an NGO, have jointly developed and implemented the Cyanide Fishing Reform Program (CFRP). Experience with the CFRP over the past five years shows that cyanide fishing can be reduced through a combination of the right policies and laws, beefed-up enforcement efforts, enhanced public awareness, cyanide testing of live-fish

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1. This paper summarises data and conclusions found in *Sullied Seas: Strategies for combating cyanide-fishing in Southeast Asia and beyond* by Charles V. Barber and Vaughan R. Pratt, published by World Resources Institute and International Marineline Alliance–Philippines, September 1997.

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exports, training of cyanide fishermen in cyanide-free live-fish capture techniques, and development of sustainable community-based resource management and livelihood alternatives that transform local fishermen into the front line of marine stewards and protectors.

One key aspect of the CFRP's initial success has been initiation of policy reforms in both source and consumer countries to create anti-cyanide fishing incentives and enforcement mechanisms. A second important element has been development of effective partnerships with fishing communities them-

## 2. Actors in the live reef-fish trade

The live reef-fish trade in South-East Asia has an estimated annual retail value of at least US\$ 1.2 billion, about US\$ 1 billion from the live food-fish trade (mostly with Hong Kong), and nearly US\$ 200 million from exports of aquarium fish to Europe and North America. Not all of the fish in the trade are caught with cyanide (Australia's live reef fishery, for example, is cyanide-free), but most of them are. To understand the dynamics of this trade, it is necessary to understand the various actors involved and the incentives that currently shape their behaviour.

### Cyanide fishermen

The number of cyanide fishermen operating in Southeast Asia and neighbouring countries is unknown. Based on estimates in the Philippines, where there are probably about 4000, the number of hard-core cyanide fishermen throughout the Indo-Pacific region probably does not exceed 20,000. In short, cyanide fishing is not a ubiquitous problem like slash-and-burn farming, practised by millions of poor farmers. Nor is poverty the root cause of cyanide fishing, although many cyanide-fishermen are certainly very poor. Rather, cyanide fishermen are a fairly small and discrete group who are responding to very specific incentives: a new technology, a ready market for the product, lax government enforcement of anti-cyanide laws, and the lack of viable livelihood alternatives.

Experience in the Philippines suggests that when cyanide fishermen are introduced to cyanide-free techniques for live-fish capture and ensured a fair price for their catch, they are willing and often eager to give up using the poison and to talk about ways to ensure the long-term sustainability of their local reefs and fisheries. Development of reliable alternative sources of income strengthens these incentives, and strict government enforcement of anti-cyanide-fishing laws further reinforces them.

selves, focusing on transfer of non-destructive technology and improvement of local livelihoods.

This paper identifies the key actors in the live-fish trade and analyses their roles and interests, elaborates the policy reforms governments of both exporting and importing countries must take to establish incentives for a cyanide-free live-fish trade, and examines the community-based strategies that lie at the heart of the CFRP's efforts to counter this ominous threat to the very heart of the planet's marine biodiversity.

### Live reef-fish exporters

The number of companies involved in the live-fish export business in South-East Asia is also unknown, but it appears to be expanding rapidly. In the early 1960s, for example, there were only three companies exporting aquarium fish from the Philippines and export of live food fish did not yet exist. By the 1990s there were some 45 aquarium fish exporters in the country, and eight companies exporting live food fish. At least 10 companies run holding tanks for live food fish in Bali, Indonesia, a major transshipment point. Conservative estimates of the annual volume of Asian trade in live food fish alone range between 20,000 and 25,000 t, mostly from Indonesia, and the real total may be far greater. Philippine government statistics show that as many as 6 million aquarium fish were exported in 1996, and Indonesia is catching up quickly.

Exporters of cyanide-caught live food and aquarium fish are responding to a strong market demand and the lack of meaningful law enforcement and monitoring by governments. Partnerships with the exporters for more sustainable live fisheries are only possible when source-country governments take strong action to eradicate the export of cyanide-caught fish and importing countries demand proof that incoming fish were not caught with cyanide.

### Live reef-fish importers

Businesses that import live food and aquarium fish are in essentially the same position as exporters: in the absence of government pressure to ensure that the fish they import were not caught with cyanide, they have little incentive to take action on the issue. As one large importer of live food fish argued: 'We the Hong Kong importers do not participate in any catching of fish or its activities. We just finance the

people by equipping them with boats and fishing gear. We just buy fish from them. The production side is left to them.'

### Live reef-fish consumers

Consumers have an important role to play in pressuring the aquarium-fish industry to take action on imports of cyanide-caught fish. Indeed, publicity and ensuing consumer pressure in Europe and North America has had some impact on aquarium-fish importers, and led to efforts such as the Marine Aquarium Fish Council in the US, discussed below. Consumer pressure against cyanide fishing is virtually non-existent among the Chinese consumers of live food fish, though. As one Hong Kong observer noted, 'being endangered actually seems to spur demand.'

### Divers and dive operators

Scuba diving and snorkelling on tropical reefs are a big and growing business throughout the Indo-Pacific. Divers and dive operators have a strong

interest in maintenance of coral reefs and healthy fish populations, and are often vocal in their support for marine conservation. Effective mechanisms have not yet been developed, however, to fully tap this group for political and financial support in combating cyanide fishing, although some efforts such as PADI's Project Aware are working to instill greater general environmental consciousness in divers and dive operators.

Engaging these diverse people in efforts to combat cyanide fishing requires two basic elements. First, government policies must provide a structure of negative and positive incentives which make cyanide fishing unattractive for the whole range of actors involved in the trade and make sustainable alternatives attractive. Second, partnerships must be developed directly with fishing communities currently using cyanide, to assist them in abandoning the cyanide-fishing tradition and adopting techniques, technologies and economic strategies which improve their livelihoods while protecting their rich marine environment.

## 3. Policy reforms to combat cyanide fishing

Cyanide fishing will not end until governments set in place effective policies to eradicate it and to encourage sustainable live-reef fisheries. The use of cyanide to catch fish is illegal in virtually every country of the Indo-Pacific, but the big profits to be made, combined with lack of enforcement and other supporting actions mean that with the exception of the Philippines, these laws do not much discourage cyanide fishing. 'Policy reform' in this context, therefore means more than passing laws. It also involves establishment of effective institutions to monitor the live reef-fish trade, enforce the laws, and provide economic incentives for fishermen, traders and consumers to shift to ecologically sustainable, cyanide-free reef fisheries.

### Policy reforms in live reef-fish source countries

#### ***Establish cyanide detection test (CDT) laboratory facilities at all major live-fish collection and transshipment points***

A simple test to determine the presence of cyanide in live fish was developed by IMA and the Bureau of Fisheries and Aquatic Resources (BFAR) and has been in use for over five years in the Philippines. Currently five laboratories test over 6,000 samples annually. An effective CDT testing network is the key for a strong effort to reduce cyanide fishing.

Without testing, authorities cannot determine whether fish have been caught with cyanide or obtain convincing evidence to prosecute violators.

To be successful, CDT labs must also be backed up by a larger network of agencies and monitoring posts, and staff trained in sampling prospective live fish shipments and rapid sample transport. Such a network requires directives on participating in sampling and monitoring from central agencies to their local offices, and training in correct sampling and shipping-to-lab procedures.

Although testing is not a panacea, it is the best technical tool currently available to identify cyanide-tainted fish and provide hard evidence with which to prosecute violators. Countries that want to provide incentives to stop cyanide fishing must be serious about developing their capacities to systematically test live fish intended for export.

#### ***Establish a national system of data gathering and monitoring that provides useful data for regulating the live-fish trade***

In order to monitor and regulate the live-fish trade, governments need accurate and appropriate data. Many national systems for collecting fisheries and export statistics do not adequately disaggregate data, making it impossible to tell, for

example, how many individuals of a particular species were collected in a particular location, exported in a given month or year, or who did the collecting and exporting. There is no way to regulate cyanide use in the live-fish trade until such data are regularly collected.

The Philippines now collects live-fish data in ways that allow the government to keep a watch over total numbers of particular fish species moving through domestic and international airports and major international seaports, activities of exporters, and other relevant information. IMA collects the data through its CDT and monitoring network, and provides it to all relevant national and provincial government offices.

***Establish a firmer legal framework to detect and prosecute cyanide fishing and trade in cyanide-caught fish, ultimately requiring mandatory testing and certification of all live reef-fish exports***

While fishing with cyanide and other poisons is banned in virtually every country in South-East Asia and the Pacific, a much firmer legal framework is needed to make these bans effective. Once a CDT laboratory and monitoring network is established, all prospective exporters should be required to submit to random sampling and testing, inspection, and government licensing. All shipments should require a certificate showing the origin, volume, and species composition of the shipment, and certifying that it has been subject to random CDT procedures and is cyanide-free.

A mandatory certification system (as will be established by law in the Philippines in late 1997) provides key positive as well as negative incentives for exporters. On the one hand, uncertifiable fish become liabilities. On the other hand, certified fish can obtain an 'environmental market premium' in markets where importing governments regulate imports and consumers prefer fish caught without cyanide.

Enforcement procedures and penalties must be fairly applied, and should focus on punishing the larger players in the trade, such as exporters and corrupt officials, and not unduly persecute the cyanide divers themselves. Governments might consider enacting strong forfeiture provisions to prosecute large operators. With this approach, violators would lose not only fish which test positive for cyanide, but also equipment such as boats and

holding facilities proven to have been used for cyanide fishing.

Nonetheless, local cyanide divers should be educated to realise that what they are doing, for whatever reasons, is illegal, and that repeat offenders will be punished harshly. This will only be perceived as just, however, when local fishermen see the big operators prosecuted first. Targeting the big cyanide fishing interests also reduces incentives for local divers to join in the trade.

***Ban or restrict the export of especially vulnerable species, such as the Napoleon wrasse (Cheilinus undulatus)***

Blanket bans on the live reef-fish trade are both unwise and unworkable<sup>4</sup> and just drive the trade underground. When the Philippines attempted a ban in parts of Palawan Province several years ago, cyanide fishermen continued to use the poison, but killed the fish after capture and sold them on the fresh-fish market. Also, bans deprive local communities of one of the most lucrative sources of income to be found in the coastal zone. The cyanide-free capture of live fish at sustainable levels with a fair return to local fishermen should be the objective of live fishery policy.

That said, the pressures on particular species may become so great that governments may want to ban their capture and export altogether. For the napoleon wrasse, highest-valued of the live food-fish species, over-exploitation may soon reach critical levels, warranting a complete ban. A ban is unlikely to stop the napoleon wrasse trade altogether, but it may reduce the total volume.

***Regulate the import, distribution and use of cyanide***

Cyanide has many legitimate uses in industry but a considerable amount of the poison is diverted into the live-fish collection business. In most countries of the Indo-Pacific region, import, distribution and use of cyanide is virtually unregulated. To remedy this problem, a draft 'Sodium Cyanide Act' that would strictly regulate the import and use of cyanide was introduced in the Philippine House of Representatives in late 1996. The draft bill requires all cyanide imports to be authorised in advance by the government, and requires the poison's sale to be 'strictly controlled'. Control elements include requirements for traders and end-users to seek authorisation from the Department of Envi-

4. Editor's note: It is true that a total ban is unworkable in large, spread out countries such as the Philippines and Indonesia. It is practical, however, in some small, compact Pacific Island countries.

ronment and Natural Resources (DENR) to purchase, distribute or use cyanide, and to file weekly reports on the sale or use of the substance. Both traders and buyers would be subject to spot checks by the government. Penalties under the Act are stiff, with prison terms for unauthorised possession or importation of cyanide ranging from 6 to 12 years and fines set at a minimum of US\$ 10,000.

While this type of law will undoubtedly be difficult to enforce, it should nonetheless increase the price of cyanide on the black market, thus making non-destructive techniques of live-fish capture more economically attractive to fishermen currently using cyanide.

### ***Address corruption within vulnerable government units such as fisheries, the navy, customs, and police forces***

The ease with which government officials charged with regulating the live fish trade can be bribed in many places works against all of the other incentives that source-country governments might put in place to stop cyanide fishing. But with so much money at stake in the cyanide-based live fish trade, corruption is a recurrent problem.

Governments can only eliminate corruption if officials at the highest levels take firm public stands against it, and when corrupt officials are dealt with harshly under the law. Heads of vulnerable agencies such as fisheries, the navy, and customs must establish firm policies that those convicted of involvement in cyanide fishing will be summarily fired and permanently barred from civil service or military positions. National police agencies and prosecutors can make it known publicly that they will seek the maximum penalties available under the law to prosecute corrupt officials.

The media can help by exposing instances of corruption related to cyanide fishing in the press. Even in societies where the press is restricted, firm government policy statements against cyanide fishing and related corruption should give the press a freer hand in reporting abuses. Finally, an effective CDT lab and monitoring network, backed up by community-based monitoring, can provide government with a great deal of information about potential corruption problems.

### ***Mount public awareness campaigns in the media and schools***

NGOs and government leaders should work systematically to build public awareness about the threat of cyanide fishing and the steps that must be taken to stop it. Press releases, symbolic public

events, and the steady provision of information to journalists are all tools that can raise public awareness and strengthen other anti-cyanide-fishing incentive measures.

In the schools, information on the values of marine resources and biodiversity, the effects of cyanide-fishing, and the tools available to stop it should be integrated into curricula from primary school onward. Cyanide fishing is a learned behaviour that becomes a tradition over time. By teaching the cyanide-free tradition in coastal-area schools from an early age, countries can help to ensure that children are fully aware of the alternatives to cyanide fishing and their positive consequences.

Divers are also potential allies in raising awareness and gathering information. In the Philippines in 1994, IMA initiated a voluntary Status of Coral Reefs (SCORE) survey, using a simple questionnaire on reef conditions which divers were asked to complete and return by mail.

By mid-1996, 200 of the 4,000 survey forms distributed by IMA had been completed and returned, providing the first new primary data on the condition of Philippine coral reefs since a survey done in 1983, including reports on suspected cyanide-fishing locations.

### ***Policy reforms in live reef-fish importing countries***

As in any transnational trade, source countries for live reef fish need the cooperation of importing country governments if their efforts to stem cyanide use at home are to be effective.

At present, no importing country requires proof that imported live fish were not caught using cyanide, or penalises firms that import fish caught with the poison. Key steps for setting up more helpful incentives in importing countries include the following:

#### ***Monitor imports of live fish and provide data to exporting countries***

Importing country governments should establish data collection and storage systems to keep track of the number by species of live fish imported, and the country of origin. They should then share those data with relevant government agencies in source countries. In this way, monitoring agencies in source countries can compare their own export statistics with import statistics and thus determine the validity of those export statistics—provided exporting countries begin to collect detailed export data, as the Philippines is already doing.

## Establishing partnerships with live-fish exporters and importers

Along with establishing partnerships with fishing communities, effective policies to combat cyanide fishing must also cultivate support from other private sector actors in both source and importing countries. Some of the most important steps in this regard include the following:

- **Ensure that testing of fish for cyanide is done rapidly, fairly and efficiently**

As already noted, establishment of cyanide-detection testing (CDT) capacities and requirements is an essential incentive for discouraging cyanide fishing. But speed is essential if cyanide-testing is to gain the support of legitimate exporters, who do not want their business unduly delayed by red tape. To that end, laboratories need to follow the Philippines' model and function seven days a week, returning test results to the exporter (with a cyanide-free certificate if the tests are negative) within 24–36 hours. Equally important, the agency managing CDT labs must be trusted to be fair, efficient, and incorruptible by the fish collectors and exporters.

- **Provide and publicise official cyanide-free certification**

As demand for cyanide-free live fish grows in overseas markets, fish that exporters can claim as reliably cyanide-free can command a higher price. This was proven in the 1980s when aquarium fish from the Philippines, tainted with that country's cyanide-fishing reputation, began to command a lower price than the same species from Indonesia—thought to be cyanide-free at the time. Preliminary evidence from the grouper fishery in Coron, Philippines, indicates that a similar market premium is beginning to operate in live food-fish markets.

Governments therefore need to formalise and publicise their certification process, both at home and abroad. For the aquarium-fish trade, this could be done at the industry's conventions, and in its trade magazines. Food-fish importers, mostly in Hong Kong and southern China, are less organised and less concerned about the environmental impacts of their trade, but this situation is likely to improve over time, as it did in the aquarium trade during the 1980s. Already, the Hong Kong Fisheries Department, The Nature Conservancy, World Wildlife Fund–Hong Kong and other groups are working to raise consumer awareness.

Partnerships with the private sector in live-fish importing countries are also important for slowing cyanide fishing. The best current example of such a partnership is the newly-formed Marine Aquarium Fish Council (MAFC) in the United States, which is the single largest market for Indo-Pacific aquarium fish. In 1996, a number of US conservation organisations and aquarium trade groups met to develop the MAFC as a body that would serve as an industry-independent governing council to establish standards and oversee environmental certification of aquarium fish imports and sales in the United States.

Composed of aquarium-fish importers, scientists, and environmental NGOs, the MAFC will establish standards for certifying aquarium fish with reference to collection methods, suitable and non-recommended species, size limits, holding and transportation methods, and other standards of practice. Costs would be borne by a percentage of the sales price, although grant funding would have to cover start-up costs to develop and test applicable certification procedures. Actual certification would be carried out by certification institutions accredited by the MAFC and adhering to the MAFC standards, not by the MAFC itself. The MAFC would require that collectors, traders and retailers adhere to all standards continuously and would identify appropriate enforcement mechanisms, including the monitoring of the chain-of-custody from reef to retailer. The council would work closely with the American Marine Life Dealers Association to reach more retailers and consumers.

### ***Phase in a legal requirement that all live reef-fish imports be certified as cyanide-free***

When live-fish exporting countries require cyanide-free certification for all exports, as the Philippines is about to do, importing countries should reciprocate by requiring all live-fish importers to provide certification from the source-country government that the fish they are importing have been certified as cyanide-free.

Since Indonesia and other exporting countries do not currently have testing and certification systems in place, it is probably unrealistic for importing countries to immediately impose a ban on imports of non-certified live fish. But importing country governments, and importers, can move in this direction by gradually phasing in a prohibition on non-certified live-fish imports, simultaneously working with exporting countries to develop testing and certification procedures, laws, and technical capacities.

Importing governments will also need to establish cooperation with groups such as IMA and the Marine Aquarium Fish Council (discussed below) which can provide independent, third-party monitoring of the certification systems that national governments set up.

### ***Provide donor assistance to live-fish exporting countries to help them combat cyanide fishing***

Live-fish importing countries that are providers of development assistance (such as the United States,

Canada, Japan and the countries of the European Union) should offer financial and technical assistance to exporting countries, to assist them in developing cyanide-fishing reform programmes and certification procedures. The Asian Development Bank has set a good example in this regard, providing some US\$ 2.7 million for the Philippines' CFRP as part of a new Fisheries Sector Loan slated for implementation in early 1998. The US Agency for International Development is also providing support for the Philippines CFRP, and is currently developing anti-cyanide fishing activities as part of its Coastal Resources Management Project in Indonesia, in collaboration with IMA.

### ***Strengthen consumer awareness about the impacts of cyanide fishing***

As in other areas of environmental certification, it is crucial to build consumer awareness. Where consumers themselves increasingly demand assurances that the fish they are buying have not been caught with cyanide, the pressures to take action on live-fish exporters and the governments that regulate them will grow rapidly.

It is important to note that **testing of live-fish imports on their arrival in importing countries is not an effective strategy, and is likely to be counterproductive.** Cyanide metabolises out of fish relatively rapidly, and tests conducted at import destinations are likely to be negative for cyanide, regardless of whether the fish was caught with cyanide or not.

## **4. Community-based strategies**

Without fishermen in the equation, there is simply no solution to the cyanide-fishing problem. There is no policy, law, or technology that can replace the need to work directly with cyanide fishermen. Training, community organisation, income enhancement, and establishment of community-based coastal management systems in communities currently using cyanide—or vulnerable to its introduction as a live-fish trade is established in their area—form the core partnership necessary to end cyanide fishing.

### ***Train fishermen in cyanide-free fishing technologies***

When fishermen are presented with effective cyanide-free technologies for capturing live-food and aquarium fish—and given greater awareness about the legal, health, and ecological risks of

cyanide fishing—many choose to convert to cyanide-free techniques.

In the Philippines, IMA has trained over 2,000 cyanide fishermen in cyanide-free live-fish capture techniques. A typical one-week local training programme targets 20–30 fishermen who are currently using cyanide to catch either live food or aquarium fish and have developed an interest, whether through IMA awareness activities or their own experiences, in learning cyanide-free techniques.

Initially, three-day on-land 'classroom' sessions provide lectures and discussions concerning the arguments in favour of cyanide-free fishing, cyanide-free technologies, post-harvest management of catches, cooperative marketing and other strategies for adding fisheries production value, and safe diving techniques.

These sessions are specialised to address specific types of live-fish capture. Fishermen who primarily collect aquarium species are trained in the use of fine-mesh barrier nets. Fishermen for whom food fish are the target species are trained in hook-and-line techniques for capturing groupers and, importantly, simple techniques for decompressing the air bladders of captured fish to ensure their post-harvest survival and health. Because particular grouper species favour distinctive bait sizes and shapes, bait preparation is a key part of the hook-and-line training as well.

Following the 'classroom' sessions, the fishermen and trainers carry out four days of in-water training in either net or hook-and-line techniques. The intensive one-week training is followed by a three-week follow-up period of monitoring by the trainers to ensure that trainees have mastered fishing techniques and proper post-harvest care. Other activities, such as organising local fishing associations and cooperatives and developing value-added livelihood activities—discussed below—take more time and involve periodic follow-up participation by the trainers over months or years.

Using this basic model, IMA in 1997 expanded training programmes to many new areas of the Philippines and now operates such programmes in five major cyanide-using regions. IMA has also initiated the first Indonesian training programme, for 60 fishermen, in North Sulawesi province, working with a local partner organisation.

### ***Enhance local income from the live-fish trade and other sources***

Fishermen's incentives to forsake cyanide fishing increase—and partnerships between fishing communities and outsiders such as IMA grow stronger—when local income from sustainable use of marine and other local resources rises. Beyond training in cyanide-free fishing techniques, IMA therefore works with fishing communities to promote a variety of livelihood enhancement activities.

When fishermen can get more money for cyanide-free live fish, they are extremely enthusiastic about converting to cyanide-free techniques. As in most poor fishing communities in South-East Asia, cyanide fishermen receive only a small percentage of the value of their catch, with the lion's share of profits accruing to middlemen. By helping fishermen obtain post-harvest equipment and know-how and assisting them develop their own marketing cooperatives and outlets, the local share of the profits can be increased.

In the area of North Sulawesi, Indonesia, where IMA initiated a training programme in July 1997, for example, the local partner organisation is the provincial cooperative of retired military veterans. By providing the fishermen with diving compressors (previously, the only one in the village was owned by a live-fish broker with a local monopoly on the trade) and offering higher prices for fish through the cooperative, the programme will break the power of the middleman and help the fishermen obtain higher prices for the cyanide-free aquarium fish they capture. The cooperative itself sees a good business opportunity, of course, but perhaps as important, the cooperative's director is also a dive-tour operator concerned about the effects of cyanide on the reefs which have made the province a premier dive destination.

Few fishing communities, however, subsist wholly from the live-fish trade. More typically, they pursue a 'portfolio' economic strategy combining live fish, fresh and dried fish, agriculture, wage labour, and other activities. An effective livelihood enhancement strategy needs to target all of these activities, and introduce new ones where an opportunity exists. Introduction of simple technologies can often add significant value to products that communities are already harvesting and selling. In Philippine fishing communities where the capture and sale of tiny dried fish (*dilis*) is a common activity, teaching simple techniques to spice the fish can raise their value by 40 per cent. Where raw oysters are collected, teaching oyster-sauce production methods adds considerable value to that product. In some communities, IMA training programmes promote non-fishery activities, such as soap making, tailoring, and handicrafts production. In short, the IMA training and livelihood enhancement strategy seeks to assist a larger socio-economic transformation of poor fishing communities towards a better standard of living based on sustainable resource use and capturing a larger share of the local profits for local benefit.

### ***Strengthen community-based management of local fisheries and reefs***

Partnerships with fishing communities must go beyond training and income enhancement, important as these elements are. Sustainable coastal management requires the participation and support of the local communities that directly earn their living from the sea, in cooperation with government agencies—an arrangement often called 'co-management'. Cyanide fishing, blast fishing, coral mining, mangrove destruction, and many other sources of coastal degradation can only be slowed when the communities on the front line become central players in protection efforts and beneficia-

## Toward a cyanide-free fishing tradition on Canipo Island, Philippines

Canipo Island is located in the Calamianes group of islands in the north of Palawan Province. The area has been a traditional fishing ground for live grouper collection, especially the high-priced spotted coral trout (*Plectropomus leopardus*). For years, hundreds of fishermen used sodium cyanide to collect groupers. In 1993, however, a local businessman engaged in live grouper collection and, dismayed at the impacts of cyanide on the reefs, started a cooperative called Kawil Amianam—Filipino for hook-and-line collecting. The group used the traditional hook and line, but also developed a method using a plastic straw for decompressing the air bladders of the captured fish, which is necessary for the fish to survive when they are rapidly brought from 20–25 m to the surface.

More than 400 fishermen in the area soon joined Kawil due to pressure from the Cyanide Fishing Reform Program (which began operations in the area and opened a Cyanide Detection Test liaison office in 1994); urging by their peers already in the group; and the fact that Kawil's decompression method exploded the long-standing myth: you can't catch live groupers with a hook and line. In 1994, the Kawil fishermen began having samples of their catch tested by the CDT lab in Manila, with assistance from the CDT liaison office. Fish sampled by the liaison office were sent to Manila by air and tested. The results (in the form of certification that the tested fish was cyanide-free) were returned to the Kawil members within 36 hours, so as not to unduly interfere with shipping of the catch.

In 1995, IMA started working with Kawil to train more fishermen in the area and to assist in modifying the bladder-decompression technique and tools, substituting less stressful large-gauge hypodermic needles for sharpened plastic straws. The Kawil hook-and-line and decompression technique is also being transferred to other areas of the country via training programmes. Sampling and testing of Kawil's catch has continued for the past two years, and the test results indicate that virtually all members of the group are continuing to use the hook-and-line method and have not reverted to cyanide use.

Major reasons for the preliminary success of the cyanide reform effort in the Canipo area seem to be 1) dedicated and persuasive leadership of the fishermen's organisation; 2) the fact that fishermen receive a higher price for cyanide-free groupers; 3) the presence of CDT sampling and monitoring personnel in the area; and 4) the self-policing of its members carried out by Kawil.

ries of sustainable management. This requires policy shifts by most governments, which have traditionally treated coastal zones and fisheries as the exclusive preserve of state power and policy.

In some areas of eastern Indonesia and the western Pacific, long-standing customary systems of marine tenure and management provide a sound institutional basis for community-based efforts. Where they exist, governments should recognise and support these customary systems and provide technical and financial inputs to assist traditional communities in adapting to rapid economic and technological changes.

Most coastal communities in South-East Asia, however, do not possess functioning customary systems

for managing and conserving coastal resources. Many are comprised of a heterogeneous mix of immigrants and natives who lost such systems long ago. This loss does not mean that viable community management systems cannot be nurtured. The Philippines, where customary coastal management systems have vanished, has the most extensive and active community-based coastal resources management (CBCRM) initiatives in Southeast Asia.

A successful CBCRM programme requires government commitment in policy and law, collaboration with like-minded donors and NGOs, and a 'learning process' of drawing on the ideas and innovations of local communities to establish, refine, institutionalise, and measure the accomplishments of CBCRM initiatives.

### ***Build the capacity of local communities to serve as front-line agents in anti-cyanide monitoring and enforcement***

Building on training, community organisation, and livelihood enhancement initiatives, an effective cyanide-fishing reform programme needs to enlist local communities as partners in the specific tasks of monitoring and enforcement. Local fishers are on the water far more regularly and know their areas better than government fisheries officers. With minimal training, which NGOs are often best equipped to provide, these groups can serve as an 'early warning network,' letting officials know when cyanide fishermen appear in an area. In the Philippines,

members of local fishermen's organisations and cooperatives have been deputised as 'fish wardens' to patrol and monitor their fishing grounds.

Although local community groups cannot be expected to directly confront well-organised—and often well-armed—cyanide-fishing vessels, they can perform important norm-setting and self-policing activities within the community. After all, a 'community' does not decide to renounce cyanide fishing. More often, one group of individuals within a community may make that decision, while others continue using cyanide. Peer pressure is thus important in spreading the cyanide-free tradition throughout the community.

## **5. Conclusion**

Cyanide fishing is not the only threat to the coral reefs and other coastal ecosystems of the Indo-Pacific region. Other threats include rapid conversion of coastal habitats such as mangroves for aquaculture, charcoal, and building materials; overfishing due to government-subsidised fleet over-capacity; dynamite fishing; haphazard coastal tourism development; runoff from industrial pollution, mining, urban wastes, fertilizers and pesticides; and sedimentation arising from deforestation. But the training and community-organisation strategies essential to stopping cyanide fishing also provide an important catalyst for communities to address a broader range of threats to their local reef environment. And four unique characteristics of cyanide fishing provide hope that it can be stopped or at least significantly reduced faster than some of the other threats to coral reefs:

- Cyanide fishing is generally focused on isolated reefs far from the effects of coastal habitat conversion and sedimentation. As a result, the problem is relatively localised and a discrete target for control efforts;
- First discovered in the late 1950s, cyanide is a relatively recent fishing technique and has only come into widespread use in the past three decades in the Philippines, much more recently in other countries. Outside the Philippines, therefore, the practice is not yet deeply embedded in local cultures and economies;

- Cyanide fishing targets a very specific and 'high-end' market—live food and aquarium fish—with some food species selling for as much as US\$ 180 per kg and some aquarium species fetching US\$ 350 per individual. The consumers and their suppliers are therefore an identifiable and fairly limited group;
- As detailed above, there is a clear and not-too-complicated set of actions to address the problem if governments set the right incentives in place, and partnerships are developed among fishing communities, exporters and importers of live-fish, scientists and NGOs.

The difficulties in stopping cyanide fishing should not be underestimated. It is important to note, though, that people have long captured and sold live fish without using cyanide, and they still do in many places such as the Caribbean and Hawaii, where live aquarium fish have been collected with fine-mesh nets for decades. Nothing is intrinsically wrong with a cyanide-free live-fish trade as long as it is practised at sustainable levels, and protects the coral reef ecosystem that provides fish habitat. But cyanide fishing is fast becoming a deadly tradition in the Philippines, handed down from father to son. It will soon be just as firmly established in Indonesia and other countries throughout the Indo-Pacific. Our challenge is to eradicate the growing cyanide tradition and replace it with a cyanide-free fishing tradition.

### **For more information on cyanide fishing and strategies to combat it, contact:**

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