WorldFish
CENTER

Annual Report 2004

WorldFish Center Annual Report 2004

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Contents

2 Letter from the Board Chair and Director General

5 Ensuring Fish for All

Institutional Changes

7 Adapting for Growth and Greater Impact

Program Highlights

11 Breeding Better Fish for Bigger Results

12 Fish From Aquaculture for Consumption and Cash

14 Powerful Tools for Fisheries Management

16 Collective Action to Protect Coral Reefs

18 Restocking Fisheries for Ongoing Benefits

19 Sustainable Harvesting of Ornamental Fish

20 Collaboration on Critical Wetlands

22 Precious Farming From the Sea

23 Troubling Projections of Fish Supply and Demand

24 Impact Analysis to Measure Success

25 Information and Communications

Annexes

28 Financial Summary

34 Major Donors

35 Institutional Partners

41 Board of Trustees

42 WorldFish Center Staff

46 Publications

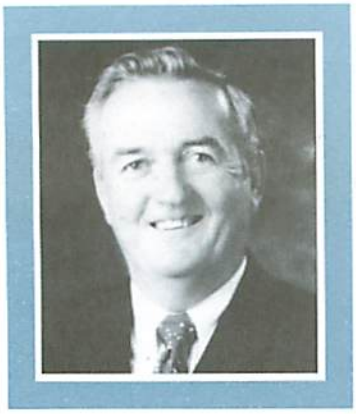
49 Contact Information

Worldfish Center at a Glance

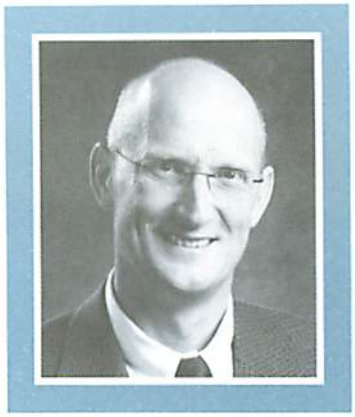
Who We Are

- The WorldFish Center is an international research organization that works to reduce poverty, hunger, and malnutrition in developing countries by making fish more readily available for food and income. The Center provides sound scientific knowledge needed to increase fish production, guide the management of fisheries and other aquatic ecosystems, reverse habitat degradation, and influence policies involving fish and the people who depend on them.
- Established in 1977 as the International Center for Living Aquatic Resources Management (ICLARM), the Center modified its name after it moved its headquarters from the Philippines to Penang, Malaysia, in 2000. Today the Center has outreach offices and field sites in eight countries.
- WorldFish is one of 15 independent research centers supported by the Consultative Group on International Agricultural Research (CGIAR). Additional support comes from other key funders.
- Partners include national and regional institutions, universities, development agencies, conservation groups, policy-making bodies, and non-governmental organizations (NGO's). The Center has activities underway in nearly two dozen countries, mainly in Asia, Africa, and the Pacific region.

Letter from the Board Chair and Director General



PROFESSOR
ROBERT E. KEARNEY
Board of Trustees Chair



STEPHEN. J. HALL
Director General

This has been an exciting and dynamic year for the Center as it began a broad program of organizational change.

While we can be justifiably proud of the Center's past achievements, and can point to many examples where our work is reducing poverty and hunger, it is essential that we continue to adapt and evolve in response to changing external realities. And there are many such changes to accommodate. Donor expectations and priorities have shifted in response to the Millennium Declaration and its goal of halving extreme hunger and poverty by the year 2015. The CGIAR continues to evolve as a system as it seeks to develop new approaches for collective action. And demands for accountability and responsiveness are increasing. The need to be nimble, efficient, and effective as an organization has never been greater.

It is with this changing landscape in mind that we embarked in 2004 on a comprehensive process of organizational transformation. Many of the key elements of that transformation are described elsewhere in this report (see page 7), but there are two important elements that are not mentioned.

The first is our recognition that WorldFish needs to strengthen its role as a global commentator; that we must use the convening power that the Center's international status bestows upon it to work more actively with our national and regional partners to move forward the development agenda in the fisheries and aquaculture sector.

The second is the recognition that, for many national governments and institutions, this development agenda is strongly guided by the Millennium Development Goals. These goals have now been formally adopted into our own medium-term goal-setting framework, and provide a much more focused lens through which to design and assess our existing and planned research activities.

The fundamental strength of the Millennium Development Goals is that they are explicit about the impacts they aim to achieve. It is in this context that we have identified three important thematic goals for WorldFish: growth, excellence, and partnership. We believe focusing on these will help increase the impact we ourselves achieve.

It is certainly not axiomatic that a research organization should increase in size, so why do we need to grow? One reason is that we are experiencing a large gap between our capacity to deliver research outcomes and the demand we are experiencing from national and regional partners. This demand suggests that if we can grow, we can increase our impact in reducing poverty and hunger. A recent analysis of the internal rate of return on investment in several key WorldFish programs showed an average rate of return of 34 percent a year. What this means is that every US$100 invested in WorldFish research generates $134 per year in benefits for poor people to whom the Center's work is targeted.

Achieving that growth also requires that we expand the scope, depth, and geographic reach of our research. Such increases, however, must not be at the expense of quality – hence, the second of our goals, which focuses on operational excellence.

Finally, we also recognize that the only way we will achieve development impacts is through high-quality partnerships with others. The simple truth is that without a comprehensive engagement with other individuals, groups, and organizations to address the problem of poverty and hunger, we will have limited impact. Partnership, therefore, must be at the absolute core of what we do.

Taken together, we believe that the changes we have embarked on at WorldFish will position us well for justifying increased investment in regions with the greatest need for the kind of development-related scientific knowledge that WorldFish provides. In particular, research investments in the fisheries and aquaculture sector are desperately needed in sub-Saharan Africa, where the sector has the potential to make an enormous contribution.

A key next step will be a comprehensive strategy review to ensure that we are focusing our efforts and resources to maximize our impact.

Looking forward to 2005, you can expect to see our organizational transformation continue apace. We have been asked on a couple of occasions whether all this change isn't leaving everyone exhausted. One has to be careful, of course, about overloading people. But our sense is that the changes we are making, although they demand strenuous effort, are releasing energy rather than consuming it. Let's remember, after all, the reason why we are doing all this. It is to make us an organization that is recognized as:

- The place people think of first when they think about fisheries and aquaculture
- The place where the best people in our field want to work
- Having a friendly, open, flexible, and responsive culture
- Delivering lasting benefits for the poor while having fun doing it
- The place where people who don't work for us wish that they did
- The first port of call for donors with a problem to solve
- The global commentator, the leading thinker, and the most innovative problem solver on how fisheries and aquaculture can benefit the poor and hungry

Above all, we want to be an organization that makes a lasting difference to the poor in developing countries.

A Clear Target: Millennium Development Goals

At a world summit in 2000, member states of the United Nations pledged to work jointly to achieve a 50 percent reduction of extreme hunger and poverty by the year 2015. They adopted eight Millennium Development Goals that together provide a coherent framework for such a campaign, and individually set explicit targets to gauge progress.

MDG #1: Eradicate extreme poverty and hunger

MDG #2: Achieve universal primary education

MDG #3: Promote gender equality and empower women

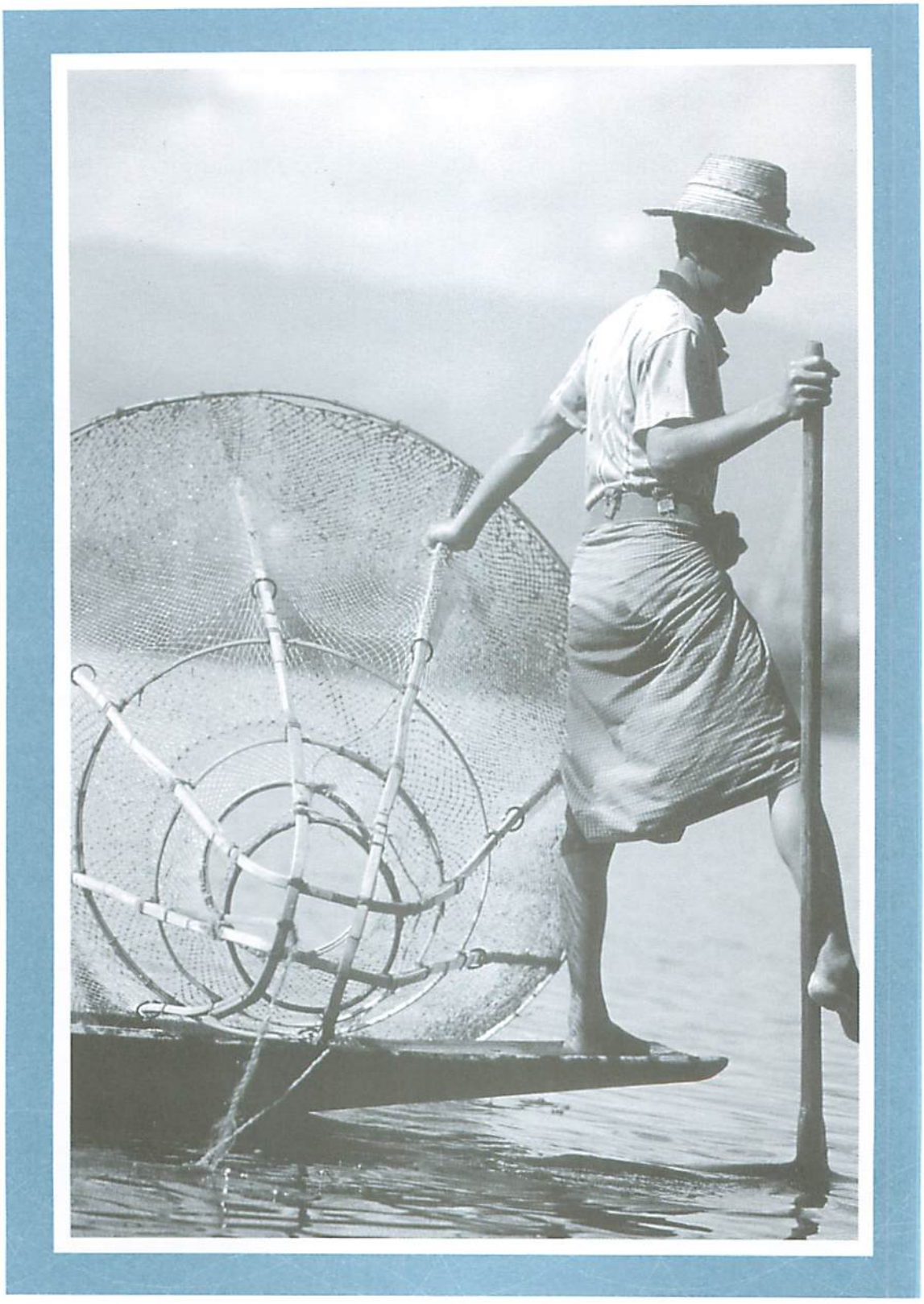
MDG #4: Reduce child mortality

MDG #5: Improve maternal health

MDG #6: Combat HIV/AIDS and other diseases

MDG #7: Ensure environmental sustainability

MDG #8: Develop a global partnership for development



Give a man a fish and he will eat for a day.
Teach a man to fish and he will eat for a lifetime.
Ancient Proverb

Ensuring Fish for All

Fish have always been a major source of food for people around the world. Rich in protein and micronutrients essential to good health, fish are especially important in the diet of poor people in developing countries. Fishing not only gives them and their families a way of feeding themselves, but also offers a source of income, and in many cases a long-term livelihood.

The World Bank estimates that 1.1 billion people now live in extreme poverty, defined as having an income of less than $1 a day. Most of these people live in Asia or sub-Saharan Africa, and most are engaged in farming or fishing.

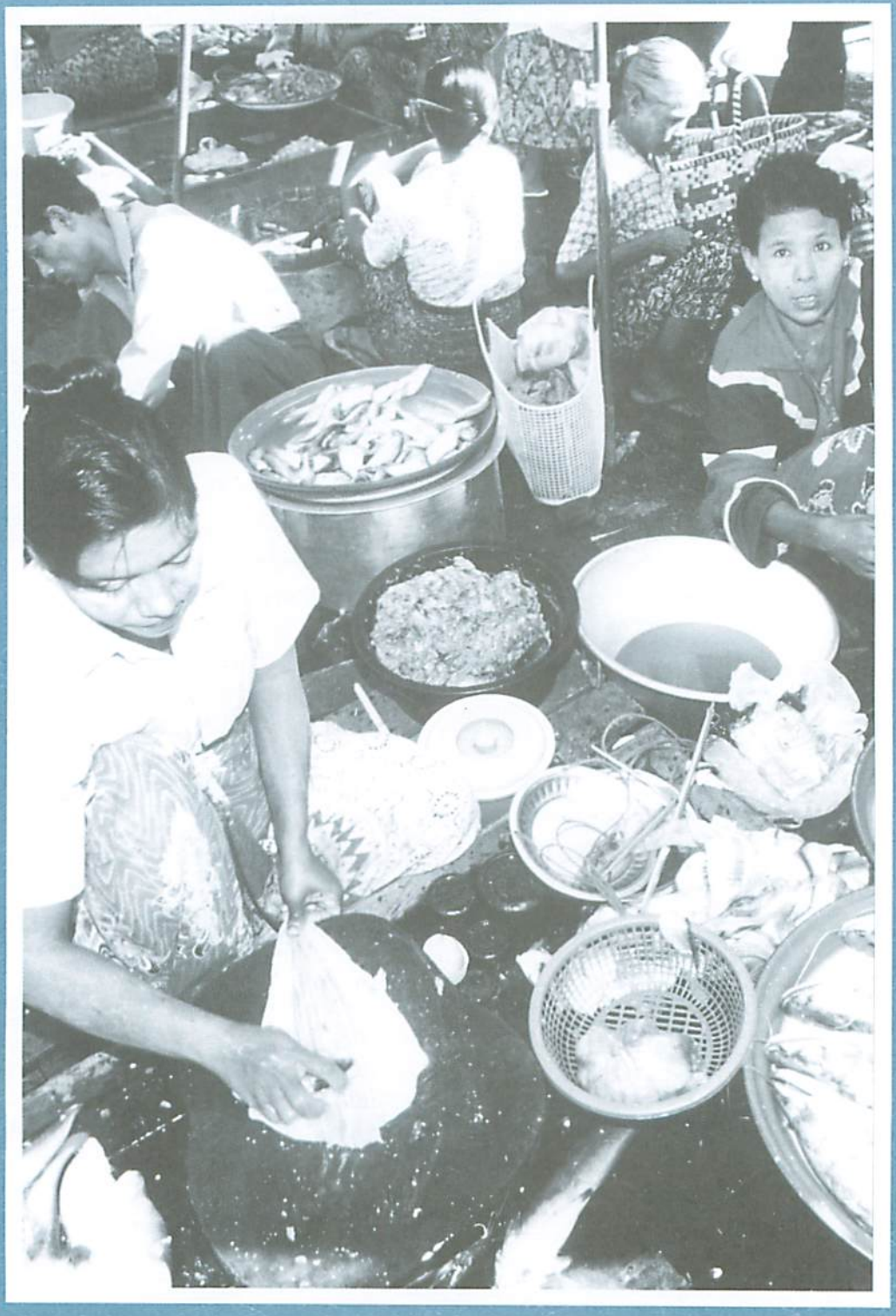
Today, however, poor people heading off to local coastlines and other waterways for the day's catch are finding their nets coming up short all too often. Stocks of fish in the wild have been declining everywhere in recent decades because of over-fishing and environmental damage. This is happening when the demand for fish has never been higher, and is expected to double in developing countries by 2020. Clearly, a global crisis in fish supply is looming unless we can reverse the destruction of aquatic ecosystems and establish environmentally sound ways of increasing fish production.

For nearly 30 years, the WorldFish Center has been applying the science of fisheries and aquaculture to help developing countries tackle this challenge.

As the examples in this report illustrate, the Center's many innovative approaches to fish production are giving an ever growing number of poor rural families more reliable access to fish, and a more secure base for their well-being. Yet considerably more must be done to meet the needs of present and future generations.

In 2002 WorldFish launched its Fish for All initiative to galvanize world action in addressing the impending crisis in the world's fisheries. The highly successful campaign has won the support of many leaders and experts at all levels. Fish for All summits in several Asian nations have fueled a sense of urgency in that region, and in 2004 the Center was planning a major Fish for All campaign in Africa, set to debut in mid-2005. Co-sponsored by the New Partnership for Africa's Development (NEPAD), it will raise awareness of the critical need to increase aquaculture and improve fisheries across Africa as a means of helping the continent – by far the world's poorest – feed its people and reduce poverty.

Fish for All is not just a campaign. More important, it is a vision. It regards fish holistically: as a source of food, an economic commodity, and a key biological resource of the planet's aquatic ecosystems. Fish for All is a vision of the world having an adequate supply of fish to meet this array of needs. Fish for All is, ultimately, the vision that drives the Center's work.



Institutional Changes

Adapting for Growth and Greater Impact

In 2004 WorldFish embarked on a program of broad organizational change designed to drive the Center's growth and development in the years ahead. All departments have been affected, directly or indirectly, by the transformation, and the process continues in 2005.

The transformation program got underway with a review of WorldFish's fundamental purpose and institutional values. From this came a new mission statement, vision statement, and codification of the Center's institutional values (see sidebar next page). The aim was to provide a clearly articulated message that would sharpen joint understanding of the Center's purpose and operating principles.

Performance Measures

In the next step of the transition, the senior managers and the Board of Trustees established a set of performance indicators and goals for the Center as a whole. The strategic principles on which the Center's new organizational framework is based emphasize the need for performance benchmarks to be targeted explicitly toward the needs and expectations of key shareholder groups. This was taken into account in drafting the first set of annual key performance goals for WorldFish, effective in 2005.

In these annual performance goals, WorldFish incorporated three thematic goals: growth, excellence, and partnership. The broad thematic goals are meant to provide general measures of performance that everyone on staff should strive to meet in their daily work, regardless of their individual roles in the organization. The three specific themes were chosen because they reflect areas in which concerted efforts will be especially necessary over the next three to five years if WorldFish is to fulfill its global mandate and increase its impact (see sidebar).

With goals established at the organizational level, the next step is to ensure that functional units and individuals have performance goals that are aligned with those of the organization as a whole, and against which their performance can be assessed. This "cascading" process will lead to a Center-wide hierarchy of performance goals that are coherent and clearly linked with WorldFish's overall objectives.

Research Projects

As part of the organizational change, the Center's research program was reorganized during the year into a matrix structure. It comprises three broad discipline-based groups on one axis – Aquaculture and Genetics; Natural Resources Management; and Policy and Social Sciences – and seven regional portfolios on the other, encompassing the following areas:

- East and Southeast Asia
- South Asia
- South Pacific
- Greater Mekong
- West Asia and North Africa
- Southern Africa
- Another African Region (boundaries to be decided)

WorldFish Thematic Goals

Growth

- Rationale: To fulfill its global mandate and expand its impact, the WorldFish Center must grow in size and in its geographic presence over the next three to five years.

Excellence

- Rationale: Excellence in science and in the way the Center operates must be a priority to meet the challenges that come with a commitment to growth.

Partnership

- Rationale: The Center will not be able to grow unless it does so in partnership with others, so partnerships must be a strong priority.

The arrangement is designed to accommodate the diverse nature of the Center's work and delineate responsibilities more clearly. Projects addressing specific geographical problems and priorities lie within the regional portfolios; others focusing on broader needs and issues that are relevant to larger groups of stakeholders (global, trans-boundary, and cross-sectoral issues, for example) straddle portfolios and disciplines as appropriate. The new structure has the advantage of providing a tighter focus in planning individual projects, and promoting multi-disciplinary research.

In this transitional stage, the names and content of some existing research projects were modified somewhat to work them into the new structure. The actual research activities, however, did not change substantially.

Under the new set-up, the responsibilities of the three Discipline Directors include, among other things, ensuring that all projects have the appropriate staffing and disciplinary skills mix required to complete them successfully. The Portfolio Directors, in turn, manage the regional projects under their jurisdiction. Each portfolio team will work to develop coherent growth strategies within its respective geographical scope; in consultation with the Center's Business Development unit, they will design new projects and identify prospective funders.

WorldFish's Mission, Vision, and Values

Our Mission

To reduce poverty and hunger by improving fisheries and aquaculture

Our Vision

To be the science partner of choice in delivering fisheries and aquaculture solutions for developing countries

Our Values

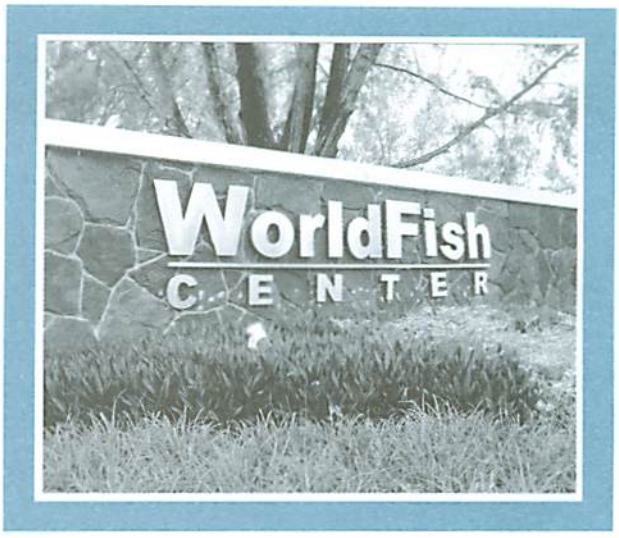
- Our two most fundamental values are *integrity and trust*. We will trust each other to be honest and open, and hold one another accountable for honoring that trust.
- In the workplace, we will strive for *fairness and equity*. We will provide equal opportunities for all staff, recognize achievement, celebrate diversity, and respect individual dignity. We will strive to practice effective leadership at all levels and empower staff so that they can give their best.
- In our work, we will search for *excellence and innovation* in all that we do. We will continually seek to improve the *quality and efficiency* of our products and services, and accept the need for risk taking and genuine mistakes as opportunities for learning. We will also value *teamwork* over individual effort, sharing knowledge amongst ourselves and our partners to build on our collective strengths and interdependencies

Business Support and Human Resources

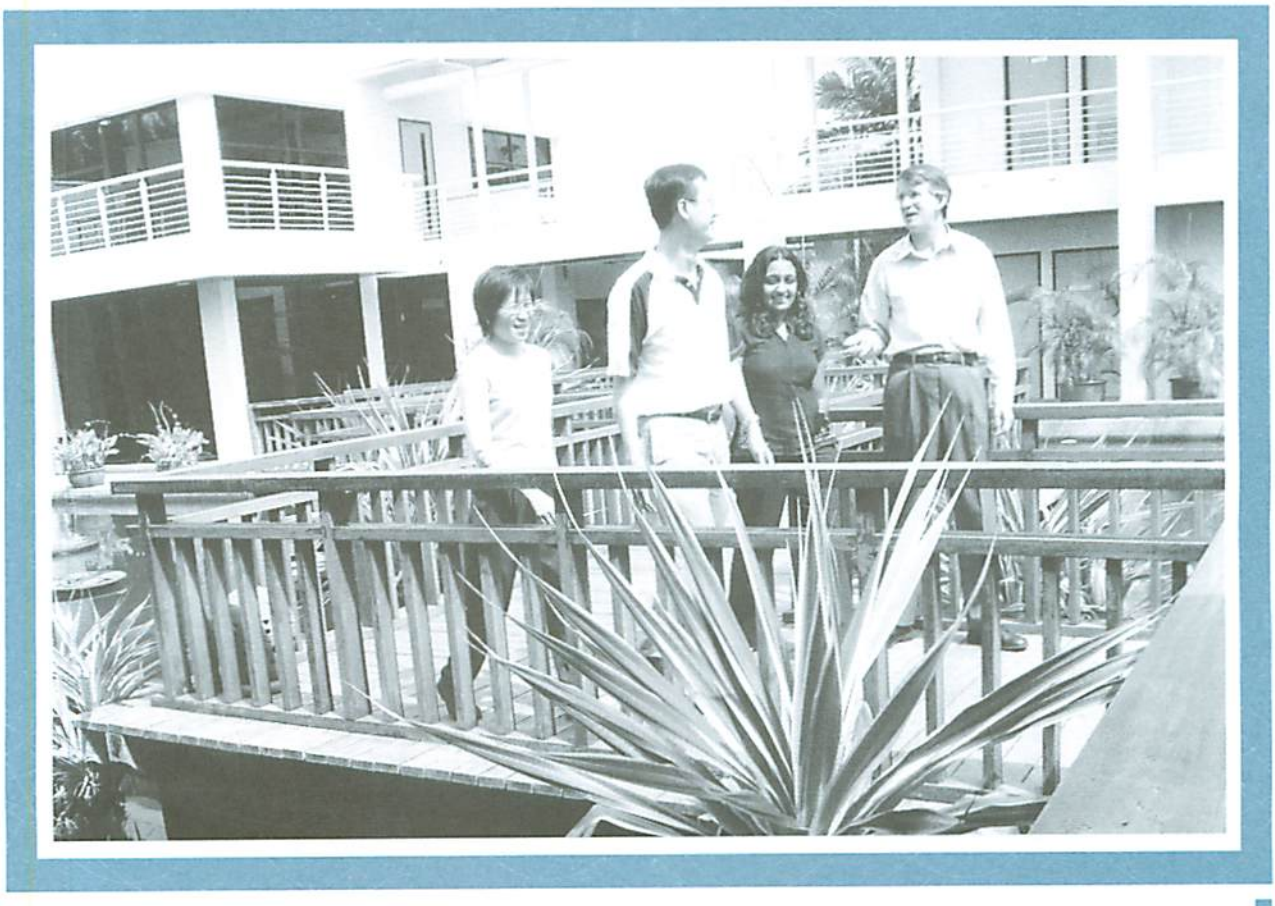
To provide greater technical support for WorldFish's growth and development, a decision was made in March to implement an "enterprise resource planning" system. This is basically a business software package that integrates information from different divisions for more efficient and transparent management of all major functions in an organization. At WorldFish, it will also allow seamless communications and better links between the Center's nine offices.

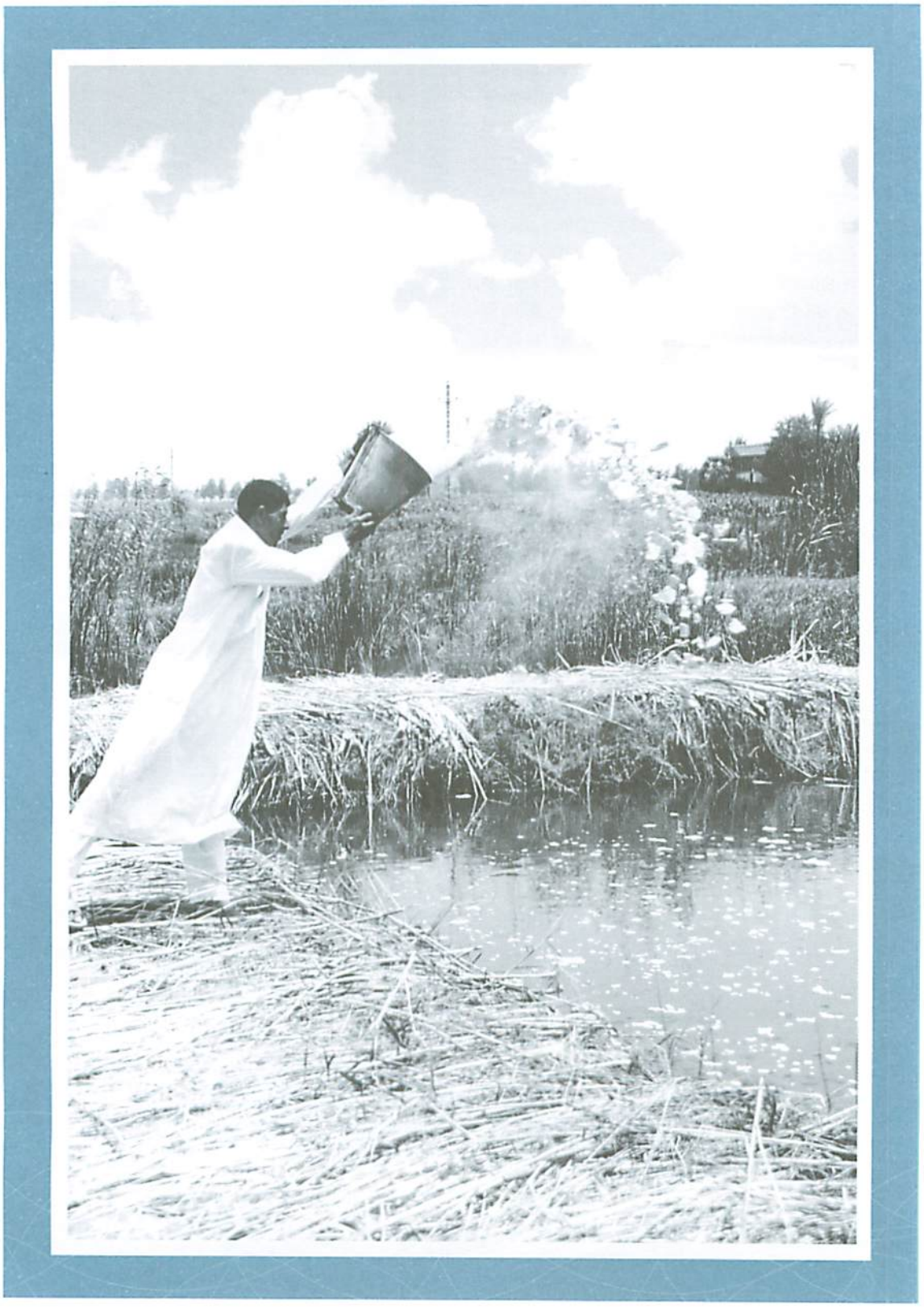
After a review of several vendors, the Center chose SAP, now used by thousands of companies and organizations around the world. In October, a contract was signed with a local supplier; installation and training were scheduled to begin in 2005. The Center's SAP system will integrate information in several key areas, including financial accounting, project management, travel services, and purchasing.

Because the new institutional framework emphasizes utmost performance at all levels of the organization, the Center also initiated a review of WorldFish's human resources policies and practices, with an eye to bringing them in line with the corporate goals. It started with a "culture audit," which led to the new mission, vision, and values statements.



Next, the Human Resources unit began an overhaul of the Center's performance appraisal system. A new job-grade structure was established, based on market rates. In addition, more training opportunities were planned, to ensure that WorldFish staff have the full range of skills required to do their jobs effectively under the new governing structure, and to strengthen internal leadership and management abilities. Further changes in this area were planned for 2005.





Program Highlights

Nile Tilapia is probably one of the first fish ever to be raised in enclosed ponds: Depictions of the fish appear on Egyptian tombs more than 3,000 years old.

Breeding Better Fish for Bigger Results

Fish farming has become an important source of food and income for many impoverished farmers and their families in developing countries. WorldFish scientists helped make it possible by pioneering the use of selective breeding techniques to produce new strains of fish well suited to aquaculture. This was necessary because some fish do not thrive and reproduce well in enclosed spaces.

From the Center's genetic research program came WorldFish's indisputable "superstar": a hardy and highly adaptable strain of freshwater tilapia known as the GIFT fish (for genetically improved farmed tilapia). The initial GIFT fish was an improved strain of Nile tilapia *(Oreochromis niloticus)*. The technology that led to its development evolved over a decade of collaborative research.

Today, the GIFT technology is being used in 15 countries (nine in Asia, five in Africa, and one in South America) to breed improved strains of native tilapia and other fish. The Center's newly published *GIFT Technology Manual: An Aid to Tilapia Selective Breeding* is a 46-page illustrated guide that will aid further transfer. Notably, the technology is based on selective-breeding techniques that take advantage of natural genetic variability within species; no transfer of genes between species is involved. The agricultural sector has used similar methods for more than half a century to breed improved strains of farm animals. All the research involving GIFT and GIFT-derived strains is done according to rigorous biosafety controls.

Aquatic over-achievers, GIFT fish grow up to 85 percent larger, mature much faster, have a 50 percent higher survival rate to adulthood, and are more disease resistant than their conventional cousins. They are cheap and easy to raise because they grow well in a wide range of environments – from ditches to ponds to flooded rice paddies – and feed on farm and household waste such as weeds and crop residue.

Because GIFT strains offer higher yields without the need for additional costly inputs, they are substantially more productive. This translates into higher income and better family nutrition for poor rural producers.

More than 200 scientists from developing countries have been trained in the GIFT technology developed at WorldFish. This knowledge transfer has provided a solid foundation for a number of developing countries to build or strengthen their own national programs for the genetic improvement of fish.

African scientists want to breed improved strains of African catfish *(Clarias gariepinus)* and other species through GIFT technology. In 2004, researchers at WorldFish's facility in Abbassa, Egypt, reported findings that clear the way for Egypt to embark on a genetic improvement program for African catfish. A robust methodology for the spawning and production of fingerlings was developed and is now being tested with farmers. Other research trials in Malawi showed that conditioning African catfish brood stock on-farm through proper feeding improved natural spawning success by 50 percent. Work is also underway in several Asian countries to develop improved strains of carp.

Also in 2004, tests in Malaysia demonstrated that a GIFT tilapia was superior to three locally cultured strains of red tilapia in terms of survival rate, growth, and fillet yield. Overall productivity of GIFT tilapia was 20 to 50 percent greater. The results show the strong potential for GIFT fish to support Malaysia's plan of boosting tilapia production for domestic and export markets.

The International Network of Genetics in Aquaculture (INGA), coordinated by the WorldFish Center, has been an important avenue for distributing GIFT germplasm and technology. A 2004 impact evaluation study in several Asian countries, conducted by the Asian Development Bank, cited INGA's central role in disseminating GIFT technology in Asia. The study found that GIFT and GIFT-derived strains accounted for 68 percent of total tilapia "seed" produced in the region in 2003.

Fish from Aquaculture for Consumption and Cash

Aquaculture currently provides about 30 percent of all the fish consumed by people around the world. With populations soaring in developing countries and native fish stocks leveling off, it is clear that aquaculture will need to play a bigger role in meeting local demand for fish. With international trade in fish rising, some developing countries see large-scale aquaculture as a promising sector for economic growth.

Localized fish-farming has tremendous potential for combating extreme hunger and poverty in developing countries because it provides, simultaneously, a number of benefits that improve human well-being. It offers a more reliable source of food, income-earning opportunities, better family nutrition, and a sustainable and environmentally friendly alternative to conventional methods of acquiring fish.

Over the past 25 years, innovative methods of small-scale aquaculture developed by WorldFish scientists and disseminated by its partners have paid big dividends in some Asian and African countries. And there is still room for expansion. The approaches vary according to local conditions and available resources.

In one approach, a growing number of rice farmers in Asia have been making their paddies more productive by adding fish to their fields. *Culture of Fish in Rice Fields*, published in 2004 by WorldFish and the U.N. Food and Agriculture Organization, notes that integrated rice and fish farming usually leads to

better yields of grain and lowers production costs because it requires fewer pesticides and fertilizers. A study done in South Vietnam showed that raising fish in rice fields could increase a farmer's profit by up to 30 percent.

In Bangladesh over the past two decades, poor people have used WorldFish techniques to convert at least a million ponds, ditches, flooded fields, and other bodies of water into "mini-factories" churning out fish for food and income. Many women in Bangladesh and other developing countries have been quick to adopt WorldFish's methods because they can be implemented easily and cheaply close to home. Some women have formed small cooperatives that have brought them status in their communities and made them economically self-sufficient. Today, 60 percent of all fish farmers in Bangladesh are women.

Meanwhile, small farmers in Malawi, Cameroon, Egypt, and other African countries are learning that growing fish alongside crops and livestock not only enables them to feed their families better, but leads to higher farm productivity overall. Basically, it works like this: Fish, raised in ponds, are fed household and farm wastes, such as maize bran. Manure from other farm animals helps enrich the ponds. The pond water sediment, in turn, is recycled as fertilizer for cash crops such as vegetables and fruits. Such farming systems offer a more secure base for providing poor rural families with food and a means of income.

Today, at least 4,000 small farmers in Malawi are now practicing some form of integrated aquaculture-agriculture – a ten-fold increase since the techniques were introduced two decades ago. That the approach has been so successful in poverty-stricken Malawi, where most farming is done on less than a hectare of land, bodes well for its potential to boost agricultural productivity in other resource-poor regions, particularly sub-Saharan Africa, where human assets are limited and natural resources are scarce or poor in quality. WorldFish's facility in Abbassa, Egypt, has been a regional hub for training researchers and technicians in aspects of aquaculture.

WorldFish is currently working in Malawi and elsewhere to find ways of adapting its methods of small-scale aquaculture to serve the special needs of HIV/AIDS-affected families in developing countries. Such households are usually headed by impoverished widows struggling to feed their children. Fish-farming approaches targeted to them must take into account, for example, conditions that include limited sources of labor and relative isolation from producer co-ops and markets.

In 2004, the findings of a 15-year WorldFish study in Malawi showed that farms where fish production had been added were 10 percent more productive, 50 percent more efficient, and had lower levels of nitrogen loss in soil than regular farms. With their farm operations more diversified, the fish-farming households had 28 percent higher income. Moreover, family fish consumption rose 160 percent, and a related analysis suggested that this could reduce childhood malnutrition by approximately 15 percent.

"My fish in the pond
is like money in the bank.
I can draw some out whenever I need it
for me or my grandchildren,
because fish is an all-year harvest."

Jessie Kaunde, a farmer
and widow in southern Malawi

Powerful Tools for Fisheries Management

Conserving the rich biological diversity of fish and managing the planet's fisheries to put them back on track toward sustainable fish production depends on reliable scientific information and good analytic tools. FishBase, a global online database, has been helping to fill that need since it was launched in 1988. Today, it is widely recognized as the best source of its kind in the world.

In 2004 the number of discrete FishBase users passed the 3 million mark, significantly higher than in 2003; monthly visits to the site rose to 14 million. Notably, there was a surge in the number of users in developing countries.

An electronic encyclopedia, FishBase has a stunning amount of information on nearly all of the world's fish – more than 28,600 known species. Biological, taxonomical, ecological, and even historical material is included, some of it dating from 250 years ago. Information from museum fish collections and geo-referenced survey data alone consist of nearly 2 million records.

State-of-the-art analytic and graphic tools make it possible for scientists, conservationists, and managers of natural resources to convert raw data into detailed assessments of the state of fisheries and coastal resources.

FishBase owes its huge success to strong links between more than a thousand co-developers. For example, the site hosts the global databases of diverse collaborators such as the U.N. Food and Agriculture Organization, the California Academy of Sciences, the International Council for the Exploration of the Sea, and the U.K.'s Natural Resources Institute.

The improvements to FishBase never stop. Users can now view the main pages of FishBase in nine languages and 16 non-Roman scripts. In 2004, the latest version of FishBase *(FishBase 2004)* was published on DVD and CD-ROM formats and distributed globally.

Trawlbase and FiRST

Though considerably smaller in scope than FishBase, TrawlBase and its related FiRST software (for Fisheries Resource Information System and Tool) is similarly valuable to its target audience: fisheries managers in Asia.

FiRST is the product of an eight-member network of Asian countries – India, Indonesia, Malaysia, Bangladesh, the Philippines, Sri Lanka, Thailand, and Vietnam – keen to improve their fisheries management capabilities and coordinate activities

Winner

In 2004 a group of 14 FishBase staff members was named
"Outstanding Scientific Support Team for 2003"
by the Consultative Group on International Agricultural Research.
Citing FishBase's importance as a global public good,
the CGIAR called it "a model for other resource management systems to follow."

aimed at rebuilding threatened fish stocks in the region. The WorldFish Center hosts TrawlBase and FiRST, which were developed with funding from the Asian Development Bank.

TrawlBase is a breakthrough for researchers and fisheries managers in Asia because it gives them access, for the first time, to baseline data on fish species and abundance in the region. The data came from thousands of fish hauls in South and Southeast Asian waters conducted by several countries since the 1920s. FiRST analysis of data over time revealed, for example, that fish stocks have declined by as much as 30 percent in some areas of Asia.

Improvements to FiRST in 2004 incorporated web-based applications that support the most widely available software. This feature will make TrawlBase even more accessible to developing countries in the region. The upgrade also included an improved mapping module.

Collective Action to Protect Coral Reefs

Coral reefs are like the rainforests of the sea, with an astoundingly diverse array of marine life. By some estimates, up to 90 percent of coral-dwelling species have not yet been identified, though many are likely to have compounds that could fuel the next generation of pharmaceuticals.

Coral reefs also have important environmental functions, such as coastal protection. Many poor communities depend heavily on reef organisms for food and income. But the world's reefs are under grave threat from over-fishing, pollution, sediment from deforestation, rock mining, and coral bleaching from global warning. Surveys suggest that in Southeast Asia, for example, 88 percent of all coral reefs are at risk. Clearly, the need for WorldFish's ReefBase has never been greater.

ReefBase is the most comprehensive online source of information and data on the world's coral reefs. The literature database has swelled to more than 24,000 references and includes 4,500 publications that can be downloaded. ReefBase's GIS-based mapping function offers fast and easy online access to interactive maps of coral reefs and reef-related datasets. As a co-partner in the Millennium Coral Reef Mapping project, funded by NASA, ReefBase is a key distributor of 1,800 full-resolution reef maps of coral reefs around the world derived from Landsat 7 satellite images.

The site's database on coral bleaching, developed jointly

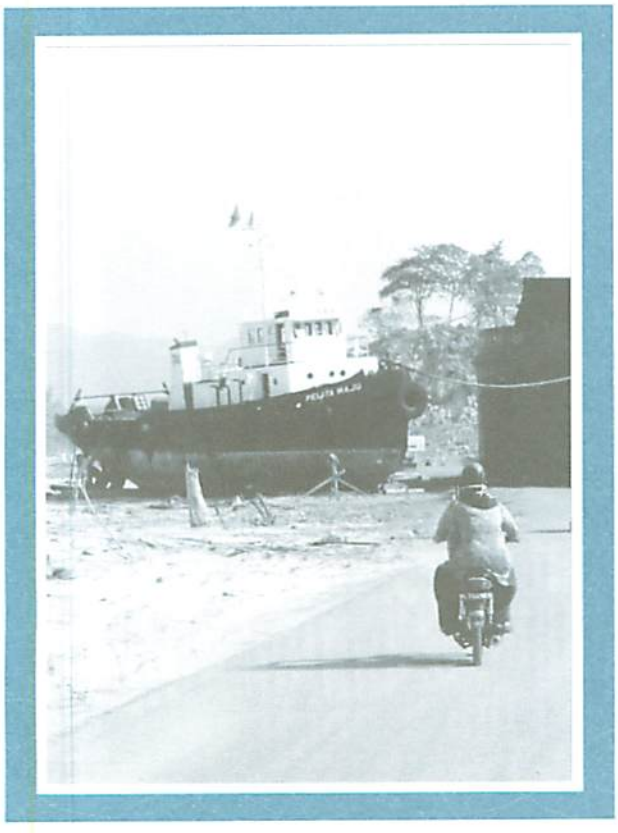
Winner

ReefBase's GIS feature was named the "Best Online Mapping Application" in 2004 in a contest sponsored by Directions Magazine and Microsoft.

with the U.S. National Oceanic and Atmospheric Administration (NOAA), is a valuable tool for monitoring this serious phenomenon. Reflecting its steadily growing influence, ReefBase in 2004 began hosting two major Web sites on coral reefs: the Global Coral Reef Monitoring Network and Reef Check. It also became the top-ranking Web site for most coral reef-related key words in all the major search engines.

Late in 2004, ReefBase prepared for the January 2005 launch of its first regional node, PacificBase, at WorldFish's office in New Caledonia. Funding from the French government and the United Nations Environment Program is supporting the expansion. Members of the ReefBase team regularly provide technical assistance to Pacific and Southeast Asian countries working to build effective databases and management systems for coral reef information. Fiji, Papua New Guinea, Indonesia, Palau, the Philippines, Micronesia, and the Solomon Islands are among the countries that have benefited.

Also during the year, WorldFish staff contributed a chapter on Southeast Asian reefs to the authoritative report "Status of Coral Reefs of the World: 2004." It was presented in June at the Tenth International Coral Reef Symposium in Okinawa. A synthesis report published by WorldFish in 2004, *Economic Valuation and Policy Priorities for Sustainable Management of Coral Reefs*, provides an overview of coral reef management and points to areas in which more research is needed to improve the current situation.



Tsunami Response

When a tsunami devastated a large swath of coastal areas in Southeast Asia in December 2004, WorldFish scientists and researchers reacted swifty to help. A dedicated Web site was created to provide regularly updated information. Staff scientists participated in post-tsunami surveys in Aceh and Sri Lanka to determine the overall impacts on people, fisheries, and other natural habitats. The ReefBase team and international coral experts around the world began mobilizing to coordinate post-tsunami assessment and monitoring of damage to coral reefs in the region.

Apart from the heavy human toll of 300,000 lives, the region's fishing sector suffered a huge blow, incurring an estimated US$500 million in losses. More than 100,000 fishing vessels were damaged or destroyed. Sri Lanka, for example, reported that nearly two-thirds of its total fishing fleet was wiped out. There was also major disturbance to the region's fishing grounds and other natural ecosystems.

At the year's end, it was clear that research to support post-tsunami recovery would become an important part of the Center's portfolio of activities in Asia, already a main region of focus. A number of collaborative projects for 2005 were under consideration. With initial funding from Germany, WorldFish and several of its CGIAR partner institutes soon began developing a framework and guidelines for rebuilding coastal livelihoods and fisheries in the affected areas. *NAGA*, WorldFish's quarterly journal, planned a special issue on the tsunami and the kind of scientific and development support that national governments in the region would need for rehabilitation. WorldFish is now a partner in the regional Consortium to Restore Shattered Livelihoods and Rebuild Communities in Tsunami-devastated Nations (CONSRN).

Restocking Dwindling Species for Ongoing Benefits

Sea cucumbers resemble enormously swollen slugs. But their homely appearance belies their value as commodities, especially in Asian countries where they are widely used in dried form for traditional Chinese medicines. The most highly prized species, sandfish *(Holothuria scabra)*, sell for up to US$75 per kilogram. Because sea cucumbers live in shallow water and are easy to catch, they have been harvested so intensely in some Asia-Pacific areas that they have nearly disappeared.

With the help of WorldFish scientists and their research partners, sea cucumbers could make a comeback over time. They are one of several valuable aquatic species now being raised successfully through special hatchery methods developed and tested in waters off New Caledonia and the Solomon Islands. This environmentally friendly coastal aquaculture offers a practical way of fast-tracking the recovery of some threatened invertebrates.

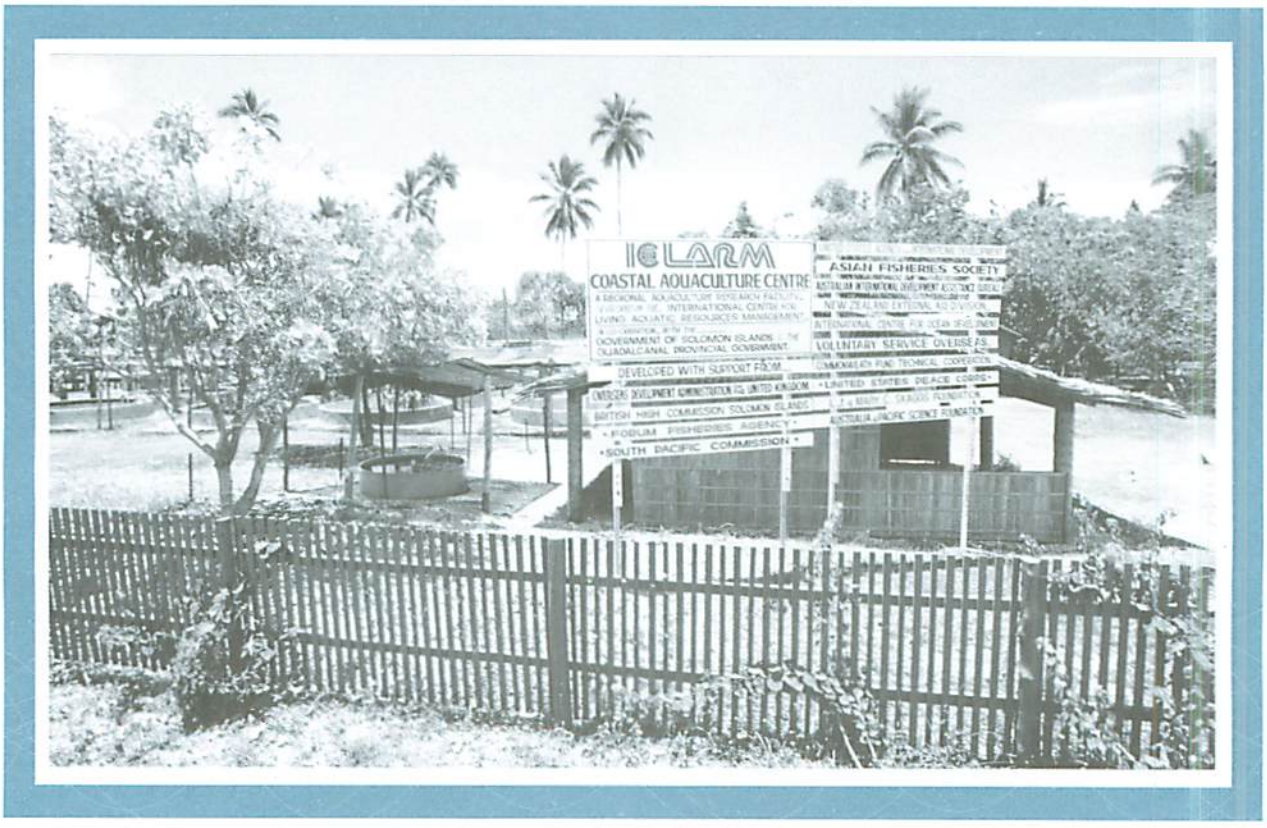
Those who stand to benefit the most are desperately poor Pacific islanders with almost no other means of earning income. WorldFish researchers are also helping coastal communities learn different processing methods that will bring them higher returns for marine products in world markets. With a greater understanding of the need to harvest aquatic resources judiciously to sustain production, villagers have been more willing to reduce their sea cucumber catches.

If sea cucumber populations can recover, underwater ecosystems will also benefit. As "bioturbators," they aerate sea-floor sediment and recycle nutrients. They also produce large amounts of larvae that other aquatic animals eat.

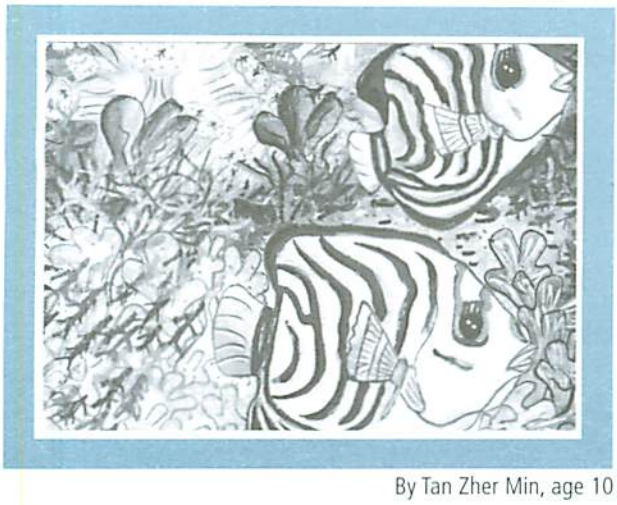
The coastal aquaculture methods have evolved in part from pioneering research in Vietnam several years ago, where WorldFish scientists hatched sandfish in captivity for the first time. Now, researchers in Vietnam are investigating ways of integrating juvenile sandfish into shrimp and lobster farming. Those industries have exploded over the last two decades, but shrimp and lobster farmers are battling disease and pollution. Sandfish could help because they improve water quality, making it harder for disease-causing pathogens to flourish.

The benefits of this work in the Pacific and Vietnam are spilling over to other regions. The Philippines and Egypt, for instance, have requested advice and training in sea cucumber rearing to replenish local stocks. The methods are also being adapted for hatchery production of other species, such as giant clams in Malaysia.

The Center's research program also includes projects that address broader issues of fisheries rehabilitation. In 2004, WorldFish scientists completed a major review of restocking and stock enhancement strategies for fisheries rich in marine invertebrates. It is being published as a 360-page book by the scientific journal *Advances in Marine Biology*.



Sustainable Harvesting of Ornamental Fish



By Tan Zher Min, age 10

Colorful aquarium fish are lovely to watch, but traditional methods of capturing them when mature are deadly to the fishes' natural habitats. Often they are captured by stunning them with cyanide or forcing them into the open sea by blasting the coral reefs where they hang out. Over-harvesting adds to the damage.

WorldFish scientists have developed an environmentally friendly and sustainable alternative. The approach involves harvesting post-larval fish captured from drifting plankton and culturing them until they reach marketable size. Natural replenishment rates are virtually unaffected because only a tiny proportion of the larval fish are caught, and they are removed from the water before the stage when natural high mortality occurs as they start settling at the bottom of the sea.

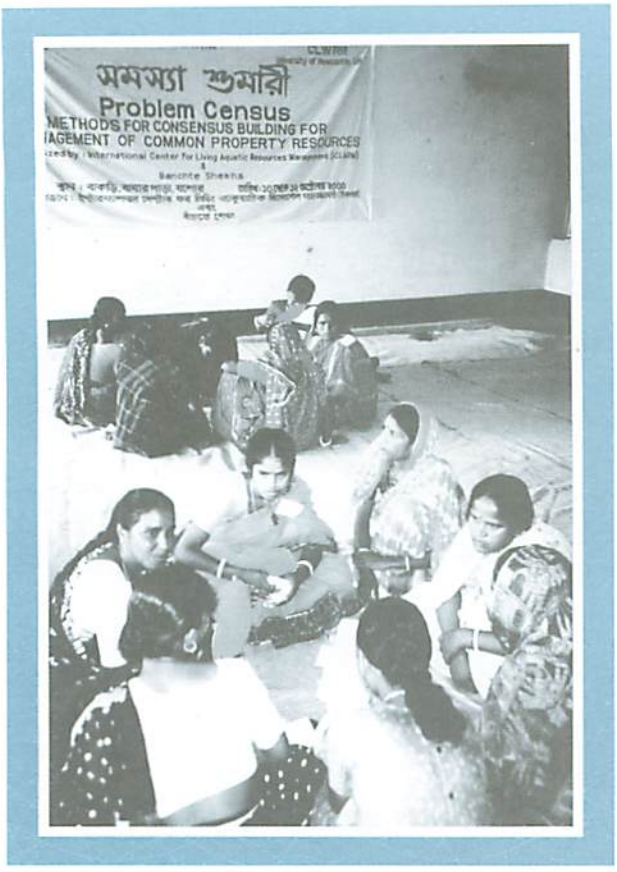
These methods could offer new livelihood opportunities in isolated villages of the Indo-Pacific region and other places where paid jobs are few and the people live mainly at a subsistence level. Conservation groups have endorsed WorldFish's approach and are helping to build commercial outlets for small producers by lobbying aquarium fans to buy only ornamental fish that have been acquired through environmentally sound methods.

Work to develop the techniques began in the Solomon Islands in 1999 in partnership with the islands' Department of Fisheries and Marine Resources and the Australian Institute of Marine Science. Today, the technology is catching on elsewhere. Other villages have heard about the project's success and want to learn the methods so they too can reap the benefits.

In July 2004, WorldFish held an extension workshop at its field station at Nusa Tupe (Western Province). Only a few weeks later, the people of one community were earning income from the sale of post-larval cleaner shrimp produced using WorldFish production techniques. Cleaner shrimp are popular aquarium fish partly because, as their name suggests, they are good at cleaning parasites from fish. A single adult cleaner shrimp fetches as much as US$18 in the U.S. market. The production methods might offer a way of supplying other highly valued species to the aquarium market. Examples include the spiny lobster, which is hard to catch in the wild and sells for up to US$25 each, and very rare goldflake angelfish, which bring as much as US$150.

The potential economic benefits of this technology are not limited to the Pacific region. WorldFish is introducing the approach in several rainforest communities in the Kripi Campo area of Cameroon as part of a long-term project to develop more diversified rural livelihoods. The aim is to develop a localized industry for the production of ornamental fish raised for export markets in accordance with international standards of fair trade and environmental sustainability.

The international marine aquarium market is worth as much as $300 million a year.



Collaboration on Critical Wetlands

Rural people who live along rivers and in monsoon-drenched floodplains know firsthand how important it is to safeguard the freshwater supplies of fish they rely on every day. Yet they have long had little say in how local wetlands are managed, which is especially a matter for concern in areas where galloping development is undermining critical ecosystems.

A number of WorldFish projects are underway to give them a stronger voice through community-based schemes for fisheries management.

A successful initiative in Bangladesh shows what highly effective stewards local people can be when given the know-how to control waterways with fish conservation and sustainable use in mind. In the past five years, with the help of researchers and non-governmental organizations, 30,000 households have organized themselves into 180 collectives controlling bodies of water that cover some 16,000 hectares in the monsoon season. On-the-ground results of their increased knowledge and cooperative efforts are impressive.

Numerous fish sanctuaries have been established to protect brood fish in the winter, and voluntary freezes on fishing in early monsoon cycles have allowed native fish to breed. Some groups have learned how to restock local waters. The efforts have also included restoring degraded habitats and tackling environmental problems. One fishing community in the Rangpur district succeeded in forcing a local polluter to begin treating its effluent and diverting it away from local waters used to produce fish.

As a result of efforts like these, fish yields have risen dramatically in many areas – in some cases to double the size of previous harvests. Moreover, the sanctuaries and other measures have helped increase the diversity of fish species in rivers and lakes by up to 30 percent.

Winner

In 2004 a community-based fisheries management project in Bangladesh executed by WorldFish and a dozen partner organizations received the CGIAR award for "Outstanding Partnership in 2003." The CGIAR called the approach, which led to significant improvements in local production of freshwater fish, an "eminently replicable model for contemporary rural development."

The approach is now being extended to other regions of Bangladesh and to deeper flooded areas of the Mekong in Vietnam. The results of this and related research, which is supported by the U.K. Department for International Development and others, are providing a basis for policies needed to guarantee rural communities a decision-making role in the management of local wetlands.

In the broader Mekong system, the task of controlling the region's vast wetlands to protect fish production and rural livelihoods is considerably more challenging. One complication is that the Mekong system straddles four countries – Vietnam, Thailand, Cambodia, and Lao PDR – but few channels exist to coordinate wetlands management and conservation. Sound management matters a lot. Inland fisheries and other important habitats are being severely damaged and depleted as a result of industrialization, urbanization, deforestation, and other pressures, posing serious consequences for the region's 65 million inhabitants.

Over the past decade, WorldFish scientists have been working along with dozens of national and regional institutions to address a range of biological, ecological, and socioeconomic issues related to the Mekong wetlands. The Swedish International Development Cooperation Agency has been a major funder of this work. One key aim is to promote more integrated management and conservation. Through research and advisory reports, the Center is contributing to inter-ministerial dialogue on wetlands and fisheries policies.

In 2004, WorldFish scientists and their co-authors from Thailand, Vietnam, Laos, and Cambodia published a synthesis report focusing on governing frameworks and economic valuation of aquatic resources in the Mekong wetlands. The Center also continued modifying its BayFish modeling tool for analyzing hydrological and environmental factors related to fish production in the region.

In Cambodia, 30 percent of the country is covered by wetlands. Many studies are being done in the Tonle Sap Great Lake area, which expands from 250,000 hectares in the dry season to 1.25 million hectares when vast areas are underwater during the monsoon. This cycle makes the lake area a rich ecosystem for fish and wildlife, but the well-being of poor rural people in the region who depend on these resources is being threatened by development.

Today, thanks to WorldFish research and the assistance of trained staff from numerous partner organizations, large areas of fisheries and forests in Cambodia are coming under the management of local communities. In the Siem Reap province, for example, more than 130,000 hectares of upland forests and fishing grounds are now under community protection and local management.

Capacity-building has been an important part of the Center's work in Cambodia. In an initiative the Asian Development Bank called "one of the best projects" it ever invested in, the Center has helped to considerably strengthen the country's Inland Fisheries Research and Development Institute, making it better equipped to develop a long-term aquatic resources management strategy for the Mekong region and the Tonle Sap basin.

Precious Farming From the Sea

To consumers with deep pockets, black pearls are a high-status fashion accessory. To poor villagers on several island-states of the western Pacific, they could become a way of life. Over the past decade, WorldFish and its research partners have been helping Solomon Islanders build a neophyte pearl-farming industry as a steady source of jobs and income.

Pond-to-market results so far are promising. In June, an elite auction house in Australia offered among its jewelry collection some pieces made with high-quality black pearls cultured at a pilot farm in the Solomons. Profits of $40,000 from this and a previous sale were used to fund a hospital near the production farm in the Western Province.

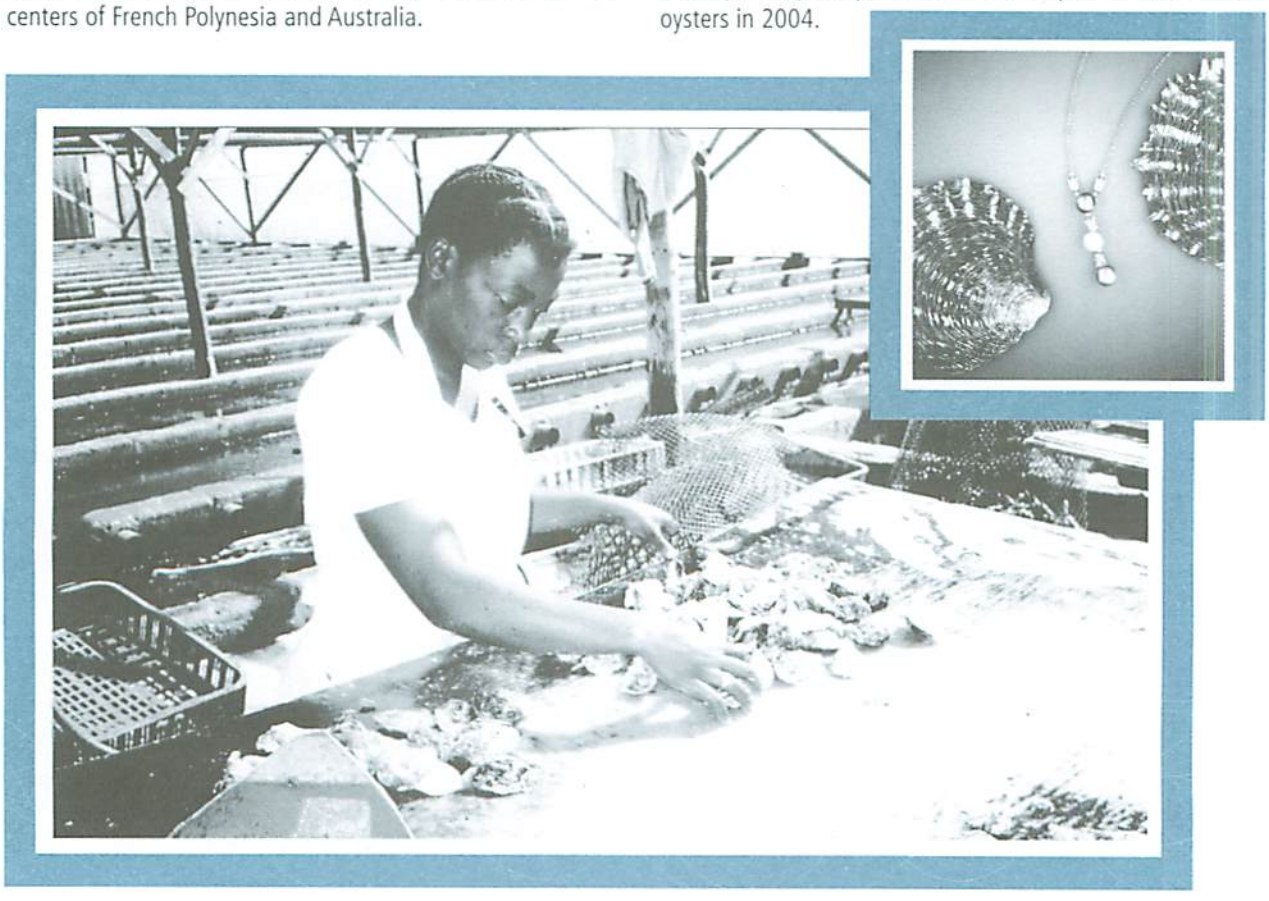
WorldFish and its collaborators, the Australian Center for International Agricultural Research and the islands' governments, hope the successful auctions will attract other pearl companies and investors, giving the Solomon Islanders a sure market for their products. The gains are promising because the global market for pearl jewelry is worth US$1.5 billion, a quarter of which is in black pearls.

One advantage that could make black pearls from the Solomons more competitive is that operating costs on the islands are much lower than in the major pearl production centers of French Polynesia and Australia.

Black pearls – which actually can have various hues, from green to deep gray – come from the black-lipped oyster *(Pinctada margaritifera)*. Although it is found widely in the tropical Pacific, black pearls had never been cultured in the western Pacific before the WorldFish project began. To get the industry up and running in the Solomons, the scientists had to find enough spat (baby oysters) to "seed" the demonstration farm, then develop production techniques that protected the spat from the region's predators and heavy algae. Today, villagers use specially developed methods to collect spat from the water, then grow them for sale to large commercial pearl farms.

An analysis showed that a single large pearl farm in the Solomons could eventually bring a hundred island families as much as US$2,000 each a year. Sustainable pearl farming in the Solomons would go a long way to helping the shattered nation rebuild its economy after years of civil unrest stemming from conflicts over land, jobs, and political power.

Interest in pearl farming is springing up on other islands in the region, where tourism is limited and the local fishing industries are collapsing from plummeting fish stocks and habitat damage. The pearl-growing technology has been transferred to Tonga and Fiji over the last few years. Fiji has already set up six pearl farms and hoped to seed 10,000 oysters in 2004.



Troubling Projections of Fish Supply and Demand

The world's vast oceans once seemed inexhaustible in their supply of fish and other marine organisms. Now, it is all too clear that their bounty is limited. Wild-fish catches have leveled off since the mid-1980s, and some stocks have been fished so heavily they may not be able to recover. Yet the world's appetite for fish keeps rising, especially as urbanization and rising income levels put more money into the pockets of consumers in developing countries.

This mismatch of supply and demand poses a serious challenge for all nations, but particularly those where millions of people already struggle to get enough to eat.

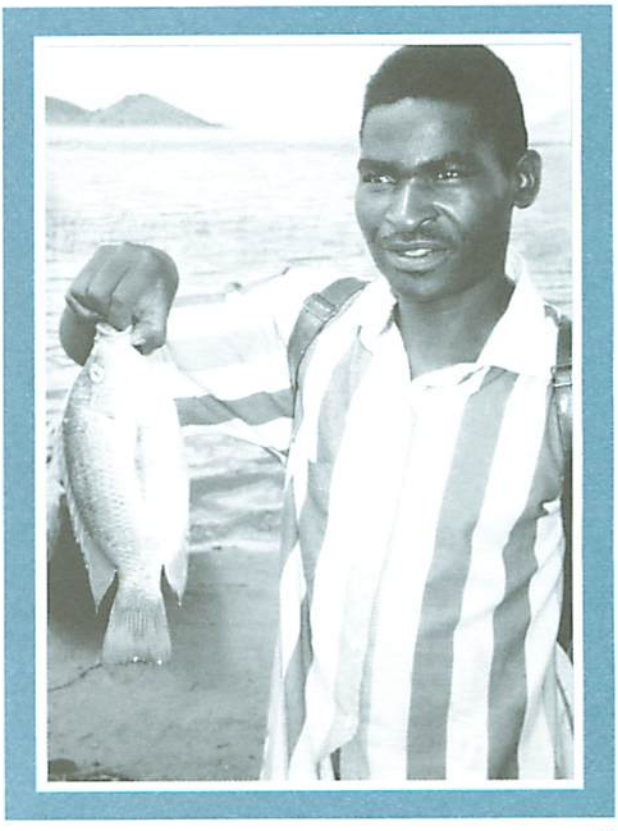
Late in 2004, the Center began wrapping up a four-year project that has helped nine nations in Asia acquire the knowledge and skills needed to project fish supply and demand in the region, and to identify areas where priority attention is needed. The information is vital because fish are a chief source of protein for people in the region, but native stocks in some waters have fallen by up to a third over the last 25 years.

The project, supported by the Asian Development Bank, led to the development of the AsiaFish Model. The unique multi-market model allows users to look, for example, at how factors such as price movements, policy and technological changes, and buyer patterns and preferences affect the demand and supply of different fish species, both wild and cultured. A dozen articles on the project results were prepared for publication in the *Journal of Aquaculture Economics and Management*.

Because intense competition for access to declining fish stocks in South and Southeast Asia is a growing problem, WorldFish is also conducting research to identify appropriate conflict-resolution strategies. A major aim of this "Fish Fights over Fish Rights" initiative, supported by the U.K. Department for International Development and the Ford Foundation, is to develop proven consensus-building approaches that promote greater cooperation among farmers and fishers scrambling to acquire fish in areas where the supply is increasingly scarce.

WorldFish's Policy, Economics and Social Sciences program was also busy in 2004 conveying the findings of an important book, *Fish to 2020: Supply and Demand in Global Markets*, to policymakers and other audiences. Published recently by WorldFish and the Washington-based International Food Policy Research Institute (IFPRI), it looks at how fish supply, demand, trade, and policies are likely to affect the world's fisheries sector over the next two decades. Major forums during the year included the Fourth World Fisheries Congress in Brussels; the Seventh Asian Fisheries Forum in Penang, Malaysia; and a Crawford Fund parliamentary seminar in Canberra.

Two regional symposiums were held late in the year to help countries in Africa and the Near East address issues of fish supply and demand. The November symposium in Malawi, sponsored by the Southern Africa Development Corporation, drew participants from 13 countries. Ten countries were represented at a similar symposium in December. Held in Kuwait, it was organized by WorldFish and the U.N. Food and Agriculture Organization.



Total catches of fish from the wild reached a plateau in the early 1990s.

Fish to 2020

Impact Analysis to Measure Success

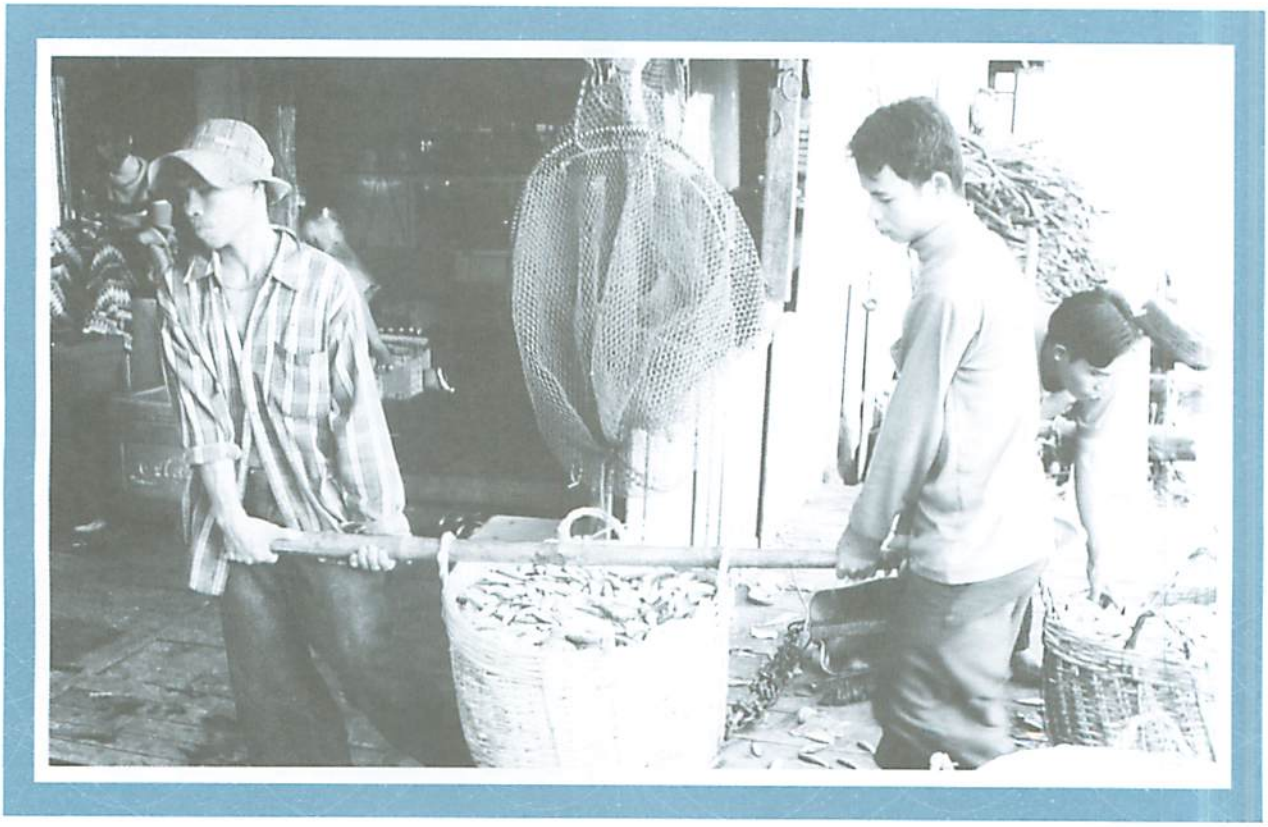
How well is WorldFish research meeting its objectives, and what kind of changes are occurring as a result of it? The answer is important to the Center's scientists and their partners, who want to know they are doing things right, and to WorldFish's donors, who want to know they are getting their money's worth.

Assessing the impact of WorldFish studies is part of the work of the Center's Policy, Economics and Social Sciences program. The findings give researchers clues on how a project could be adapted to ensure that more people benefit from the results. In 2004, the program developed and proposed a new framework for impact assessment at the WorldFish Center. The approach, described in the Center's journal *NAGA* (vol. 27, Nos. 3 and 4), offers a framework for analyzing benefits from aquatic resources research, the relevant research categories, pathways to impact by category, and indicators along each pathway that can be estimated to quantify probable research impact.

The impact assessment of a recently completed WorldFish project was singled out for excellence by the panel that reviewed it in 2004. The study, based on a 15-year collaborative project in Malawi, found that farmers who adopt methods of integrated aquaculture-agriculture could significantly boost the local availability of fish for food and income, while making their farms more productive. Members of the CGIAR Panel on Impact Assessment were so impressed with the study – calling it "impressive" and "unique" – that they agreed to sponsor publication of the results in book form.

The Policy, Economics and Social Sciences program also looks at how a host of factors – from globalization and trade policies to fisheries management and dam-building – are likely to affect important aquatic ecosystems and the poor people who depend on them critically for basic needs. The results are needed to guide the development of policies aimed at protecting threatened species and ecosystems, and ensuring sustainable livelihoods.

In 2004, for example, WorldFish researchers contributed scientific knowledge to international efforts to protect Pacific sea turtles, which are on the brink of extinction. In August, the Center and several partner organizations issued a "Blueprint for Action on Pacific Sea Turtles," emanating from a Bellagio Conference in late 2003. The Blueprint urges countries to protect all nesting beaches and reduce turtle catches at sea, among other things.



Information and Communications

With scores of editorial projects in the pipeline at any given time, the Center's Information and Communications unit has to scramble to keep up. In 2004, the office produced nearly three dozen major publications and other information products in a variety of formats. They included technical reports and manuals, policy briefs, corporate materials, and two double issues of the WorldFish journal *NAGA*. Additional materials including flyers, press packets, and posters that helped showcase the Center's research at nearly a dozen conferences and other high-visibility events during the year.

Thanks to the unit's efforts, WorldFish was well represented at the 2004 meeting of the Parties to the Convention on Biological Diversity in Kuala Lumpur; the Fourth World Fisheries Congress in Vancouver; the Seventh Asian Fisheries Forum in Penang, Malaysia; a Crawford Fund seminar at Parliament House in Canberra; the International Coral Reefs Symposium in Okinawa; and the CGIAR annual meeting in Mexico City. Some WorldFish materials for these events were published in Spanish and Japanese.

Media outreach during the year led to extensive coverage by newspapers, magazines, wire services, television and radio outlets, and conservation websites around the world. Articles appeared in publications such as *The Economist*, *Far Eastern Economic Review*, *The Daily Star* (Dhaka), *The Daily Times* (Malawi), *Canberra Times*, *Hindustan Times*, *The South Coast Today*, *New Straits Times* (Singapore), *The Boston Globe*, *Los Angeles Times*, *The Denver Post*, and numerous Chinese and Malaysian newspapers.

By Loo Carmen, age 9

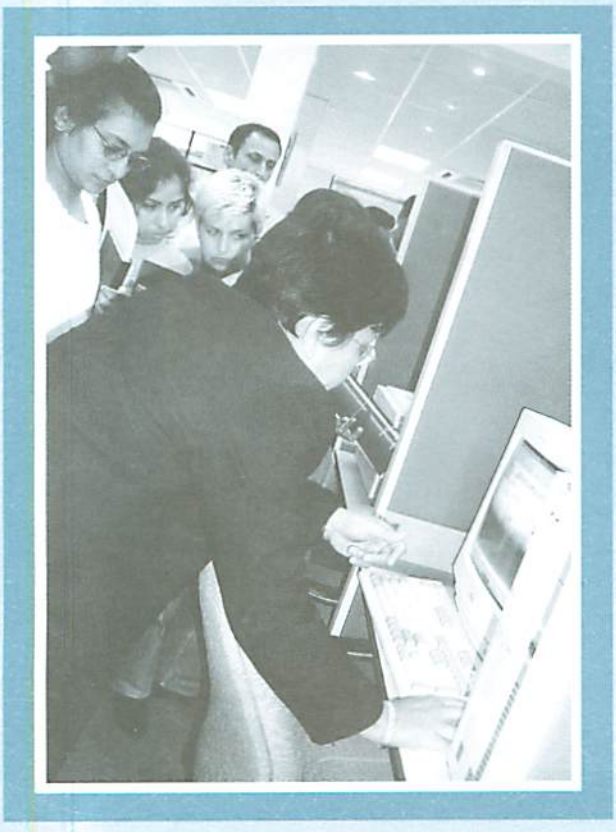
Also in 2004, the office expanded its normal activities to support the Center's process of organizational change (see page 7). The staff planned a campaign to keep WorldFish employees fully informed about developments. One initiative was a new internal newsletter, *FishBytes*, which proved to be a hit when it debuted early in 2005. Two workshops, aided by a human resources specialist from CGIAR, were conducted to brief the staff on the unit's vision of building a Center-wide "community of communicators."

The Center's library and online services are among the functions managed by the Information and Communications unit. An online book reservation and renewal system was installed in 2004, and book acquisitions raised the total number of printed volumes in the library's collection to 16,296.

In a measure proposed to reduce internal operating costs, discussions were held on a pilot project to test the viability of sharing library and information services with other compatible organizations. Three other CGIAR institutes and the U.N. Food and Agriculture Organization's Library and Documentation Systems Division were among the prospective partners.

With a redesign of WorldFish's website planned for 2005, an external consultant reviewed the format in December to recommend changes that would improve usability.

In a community outreach initiative, the Information and Communications unit partnered with local companies and organizations in publishing a calendar sold to support a charity in Penang, Malaysia. The calendar, which featured the theme "Save Our Seas," featured photos and text provided by WorldFish along with colorful children's artwork.



Annexes

28 Financial Summary

34 Major Donors

35 Institutional Partners

41 Board of Trustees

42 WorldFish Center Staff

46 Publications

49 Contact Information

Financial Summary

WorldFish Center seeks to ensure that its operating service strategy is built on a client-oriented culture dedicated to delivering carefully targeted services to meet the broad range of needs of its internal and external clients. WorldFish Center adopts the cost-conscious approach and ensures the delivery of high value services at costs comparable to, or less than, the market. Senior management, the Board, the internal auditor, and the external auditor Ernst & Young provide the financial management and oversight of the Center.

The Center's total income in 2004 was US$15.03 million, and level of income in 2003 was US$16.0 million. This income was distributed as follows (in millions):

Total income

Unrestricted	US$ 6.48
Restricted	US$ 7.67
Other Income	US$ 0.88

The Statement of Financial Position, the Statement of Activities, and the Statement of Cash Flows summarize WorldFish Center's finances in 2004. These financial statements follow. A complete, audited financial statement by Ernst & Young is published separately and can be requested from the office of the Director General.

Statement of Financial Position
(US Dollar '000)

	December 31	
	2004	2003
ASSETS		
CURRENT ASSETS		
Cash and cash equivalents	14,223	12,032
Accounts receivable		
Donors	2,135	4,238
Employees	104	118
Others	1,626	1,374
Other current assets	405	175
Total current assets	18,493	17,937
NON-CURRENT ASSETS		
Property and equipment, net	366	394
Other assets	107	79
Total non-current assets	473	473
TOTAL ASSETS	18,966	18,410
LIABILITIES AND NET ASSETS		
CURRENT LIABILITIES		
Accounts payable		
Donors	3,127	4,128
Employees	107	79
Others	2,106	1,888
Accruals and provisions	2,706	2,388
Total current liabilities	8,046	8,483
NON-CURRENT LIABILITIES		
Accounts payable - Employees	333	359
TOTAL LIABILITIES	8,379	8,842
UNRESTRICTED NET ASSETS		
Designated	2,998	2,670
Undesignated	7,589	6,898
TOTAL NET ASSETS	10,587	9,568
TOTAL LIABILITIES AND NET ASSETS	18,966	18,410

Statement of Activities
(US Dollar '000)

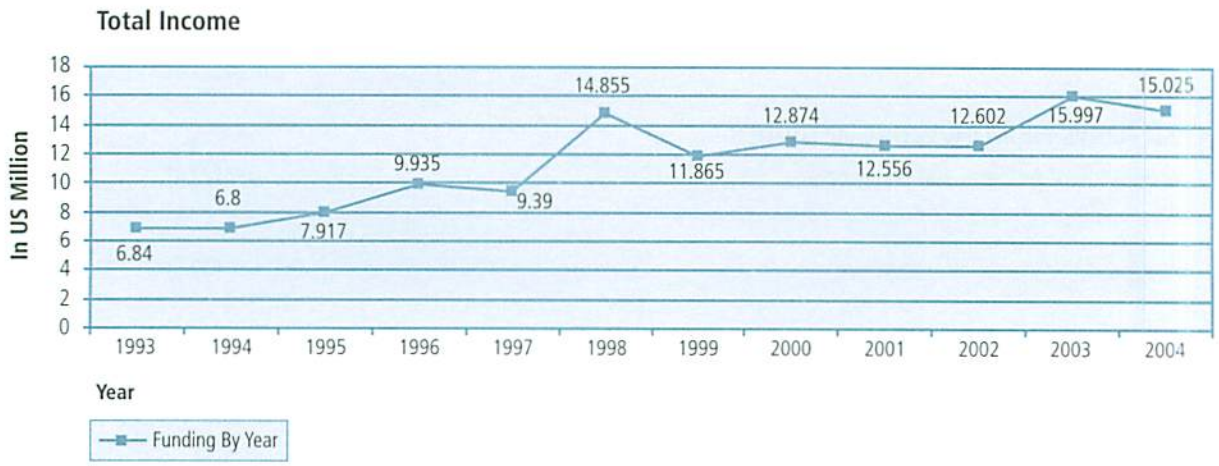
	For the Years Ended December 31			
			Total	
	Unrestricted	Permanently Restricted	2004	2003
REVENUES, GAINS, AND OTHER SUPPORT				
Grants	6,476	7,670	14,146	14,632
Other revenues	879	-	879	1,365
Total revenues, gains, and other support	7,355	7,670	15,025	15,997
EXPENSES AND LOSSES				
Program related expenses	4,148	7,670	11,818	12,502
Management and general expenses	2,854	-	2,854	3,010
General operations	127	-	127	921
Total expenses	7,129	7,670	14,799	16,433
Indirect cost recovery	(793)	-	(793)	(774)
Total expenses and losses	6,336	7,670	14,006	15,659
CHANGE IN NET ASSETS	1,019	-	1,019	338
NET ASSETS				
Beginning of the year	9,568	-	9,568	8,998
Appropriated for acquisition of equipment	-	-	-	232
End of the year	10,587	-	10,587	9,568
MEMO ITEM				
Operating expenses - By nature of classification				
Personnel costs	4,039	2,421	6,460	5,861
Collaborators / Partnership costs	21	2,464	2,485	2,560
Supplies and services	1,345	2,093	3,438	5,719
Operational travel	747	625	1,372	1,332
Depreciation	184	67	251	187
	6,336	7,670	14,006	15,659

Statement of Cash Flows
(US Dollar '000)

	For the Years Ended December 31	
	2004	2003
CASH FLOWS FROM OPERATING ACTIVITIES		
Change in net assets	1,019	570
Adjustments to reconcile change in net assets to net cash provided by operating activities:		
Depreciation	251	187
Provision for doubtful debts	-	870
Gain on disposal of property and equipment	(2)	(4)
Decrease / (increase) in assets		
Accounts receivable	1,865	(1,511)
Supplies inventory	-	2
Other current assets	(258)	2,864
Increase / (decrease) in liabilities		
Accounts payable	(755)	566
Accruals and provisions	292	(469)
Net cash provided by operating activities	2,412	3,075
CASH FLOWS FROM INVESTING ACTIVITIES		
Acquisition of property and equipment	(224)	(232)
Proceeds from disposal of property and equipment	3	11
Net cash used in investing activities	(221)	(221)
NET INCREASE IN CASH AND CASH EQUIVALENTS	2,191	2,854
CASH AND CASH EQUIVALENTS		
Beginning of the year	12,032	9,178
End of the year	14,223	12,032

Funding by Year 1993 - 2004

(' In US 000)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Funding by year	6.84	6.80	7.92	9.94	9.39	14.86	11.87	12.87	12.56	12.60	16.00	15.03
Consists of	(restated)											
Grant	6,840.00	6,595.00	7,776.00	9,574.00	9,047.00	14,543.00	11,606.00	12,379.00	12,125.00	12,492.00	14,632.00	14,146.00
Other income		205.00	141.00	361.00	343.00	312.00	259.00	495.00	431.00	110.00	1,365.00	879.00
	6,840.00	6,800.00	7,917.00	9,935.00	9,390.00	14,855.00	11,865.00	12,874.00	12,556.00	12,602.00	15,997.00	15,025.00
Grant												
Unrestricted		3,285.00	4,293.00	5,793.00	5,630.00	6,772.00	6,139.00	7,014.00	6,346.00	6,046.00	6,625.00	6,476.00
Restricted		3,310.00	3,483.00	3,781.00	3,417.00	7,771.00	5,467.00	5,365.00	5,779.00	6,446.00	8,007.00	7,670.00
		6,595.00	7,776.00	9,574.00	9,047.00	14,543.00	11,606.00	12,379.00	12,125.00	12,492.00	14,632.00	14,146.00



Funding by CGIAR Members (2004)

	US$ millions
Unrestricted Support	
Europe	
Netherlands	1.1
Norway	0.7
Sweden	0.4
Denmark	0.3
Germany	0.3
United Kingdom	0.3
Belgium	0.1
North America	
Canada	0.7
United States	0.7
Pacific Rim	
Australia	0.3
New Zealand	0.1
Japan	0.1
Developing countries	
Egypt, Arab Republic	0.3
International and Regional Organizations	
World Bank	1.0
Others, Multi-donor	0.1
Total for Unrestricted Support	**6.5**

	US$ millions
Restricted Support	
Europe	
United Kingdom	2.6
Germany	0.2
Sweden	0.2
North America	
United States	1.3
Pacific Rim	
Australia	0.2

International and Regional Organizations

	US$ millions
ADB	1.0
Commission of the European Community	1.0
Challenge Program	0.2
IFAD	0.1
Global Environment Fund - World Bank	0.1
Others - CGIAR Members	0.3
Total for Restricted support by CGIAR members	**7.2**
Subtotal	**13.7**

Funding by CGIAR non-members

	US$ millions
Provinces of New Caledonia	0.2
Others - non-CGIAR Members	0.2
Total for Restricted Suppport by non- CGIAR members	**0.4**
Total for Funding in 2004	**14.1**

Major Donors

Asian Development Bank
Australia
Australian Institute of Marine Sciences
Belgium
Consultative Group on International Agricultural Research (CGIAR)
China
Denmark
Egypt
Environmental Defense
European Commission
German Fund for International Development (DSE, now called InWent)
Ford Foundation
France
Germany
Global Environment Fund (World Bank)
Ichthyological Society of Taiwan
India
International Development Research Center
International Fund for Agricultural Development
Interdisciplinary Research and Education Fund (INREF-POND)
System Wide Initiatives in Water Management (CG-IWMI)
Japan
Netherlands
New Caledonia
New Zealand
National Oceanographic and Atmospheric Administration (NOAA)
Norway
Oxfam America
Philippines
Rockefeller Foundation
Species 2000 Secretariat
Sweden
Thailand
United Kingdom (DFID)
UNDP – Technical Cooperation Among Developing Countries
United Nations Environment Program
United States Agency for International Development
Western Pacific Council
World Bank
World Wildlife Fund Indonesia

Institutional Partners

Australia

Advisory Panel from Advanced Scientific Institutions in Australia
Australian Institute of Marine Science
Australian Mekong Resource Center
Commonwealth Scientific and Industrial Research Organization
James Cook University
Deakin University
Department of Fisheries
Great Barrier Reef Marine Park Authority
Greenward Consulting
Griffith University
Queensland Department of Primary Industries
Queensland University of Technology
University of Sydney
University of Tasmania
University of Western Sydney

Bangladesh

Alternative Development Initiative (ADI)
Association for Community Development
Association for Rural Service and Human Inducement
Banchte Shekha
Bangladesh Agricultural Research Council
Bangladesh Agriculture University
Bangladesh Centre for Advanced Studies
Bangladesh Environmental Lawyers Association
Bangladesh Fisheries Research Institute
Bangladesh Rural Advancement Committee (BRAC)
Barendra Advancement Integrated Committee
Bikalpa Unnayan Karmasuchi
Bureau of Socioeconomic Research and Training
CARITAS
Center for Alleviation of Rural Poverty
Center for Integrated Rural Progress
Center for Natural Resources Studies, Department of Fisheries
Center for Rural and Environment Development, Department of Fisheries
Chandradip Development Society
Coastal Association for Social Transformation Trust
Department of Fisheries
Dishari Samaj Kallyan Sangtha Dulai Jana Kallyan Sangstha
Dustha Mohila Gono Shikha & Hasta Shilpo Proshikhan Kendra
Efforts for Rural Advancement, Fisheries Research Institute
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GHARONI
Grameen Manobic Unnayan Sangstha
Gram Sampad Unnayan Kendra
Integrated Social Welfare Association
Jagorani Chakra
Landless Distressed Rehabilitation Organization
Local Initiative for People's Progress
LUSTRE
Manabik Unnayan Kendra
Organization for Rural Development
Organization of Rural Economic Development and Rehabilitation
PAGE Development Center
People's Organization for Sustainable Development
Program on Agriculture, Nutrition, and Environmental Conservation
Project Peeth
PROSHIKA
Rural Agricultural Social Development Organization
Rural Reconstruction Centre
Samaj Progoti Parishad
Shikkha Shastha Unnayan Karzakram
Shristy Samaz Kallayan Mohila Sangstha Shushilan
Social Advancement Through Unity
Social Association for Rural Advancement
Society for Development Committee
Sunamganj Jonokallan Sangsta
Thengamara Mohila Sabuj Sangha
University Grant Commission
University of Chittagong
Voluntary Paribar Kalyan Association
Welfare Effort

Belgium

Musée Royal de l'Afrique Centrale

Belize

Caribbean Fisheries Technical Unit

Brazil

Estaçao de Piscicultura da Universidade Estadual de Maringa

Brunei

Department of Fisheries

Burkina Faso

Université de Ouagadougou

Cambodia

CBNRM Learning Initiative/WWR Cambodia
Department of Agronomy and Agricultural Land Improvement
Department of Fisheries
Fisheries Action Coalition Team (FACT)
Inland Fisheries Research and Development Institute (IFReDI)
Ministry of Agriculture, Forestry and Fisheries
Ministry of Environment
Ministry of Tourism
National Mekong Committee
National Park and Wild Life Centuaries
Royal University of Phnom Penh
Tonle Sap Biosphere Reserve Secretariat

Cameroon

International Institute of Tropical Agriculture – Humid Forest Center

L'Organisation pour l'Environnement et le Développement Durable

Ministère de l'Elevage, des Pêches et des Industries Animales de Cameroun (MINEPIA)

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University of Guelph

University of Manitoba

Caribbean

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Caribbean Community Fisheries Resources Assessment and Management Program

National Center for Caribbean Coral Reef Research (NCORE)

Chad

Lake Chad Basin Commission

China

Center for Chinese Agricultural Policy

Chinese Academy of Sciences

Environmental Protection Administration

Freshwater Fisheries Research Center

Shanghai Fisheries University

Cote D' Ivoire

Centre National de Recherche Agronomique

Denmark

Danish Hydraulic Institute

Institute of Fisheries Management and Coastal Community Development

North Sea Center

Egypt

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Cairo University

Central Laboratory for Aquaculture Research

General Authority for Fisheries Resources Development

Lake Nasser Development Authority

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Multi-Sector Support Program

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Ethiopia Agricultural Research Organization

Federated States of Micronesia

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Aquaculture Division

Fisheries Division

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University of the South Pacific

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Finnish Environment Institute

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University of Paul Sabatier

University of Paris

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Hohenheim University

Institut für Meereskunde

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University of Hamburg

KWI Management Consultants

Entidad Colaborada de la Administraciön

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University of Kiel

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Water Research Institute

Hong Kong

University of Hong Kong

Hungary

Fish Culture Research Institute

India

Central Inland Capture Fisheries Research Institute

Central Inland Fisheries Research Institute

Central Institute of Freshwater Aquaculture

Central Marine Fisheries Research Institute

Indian Agricultural Research Institute

Indian Council for Agricultural Research

National Bureau of Fish Genetic Resources

National Center for Agricultural Economics and Policy Research

Tata Energy Research Institute

University of Agricultural Sciences

Indonesia

Agency for Marine Affairs and Fisheries Research
Bahtera Nusantara
Bogor Agricultural University
Central Planning Agency-BAPPENAS
Central Research Institute for Fisheries
Central Research Institute of Aquaculture
Center for Agricultural Socio-Economic Research
Center for Socio Economic Studies in Agriculture
Center for Soil and Agroclimate Research
Diponegero University
Directorate General of Coasts and Small Islands
Directorate of Fisheries Resource Management
Directorate General for Capture Fisheries
Directorate General of Aquaculture
Directorate General of Fisheries
District and Provincial Government
Hassanudin University
Indonesia Coastal and Marine Foundation
Indonesian Fisheries Socioeconomics Research Network
Indonesian Institute of Mangrove Research
Indonesian Institute of Science – Research Center for Oceanography
Indonesian Network on Coastal Management
Indonesian Seagrass Committee
Jaringan Kerja untuk Pesisir dan Laut (Indon Network for Marine and Coastal Resources – JARING PELA)
Ministry of Finance
Ministry of Marine Affairs and Fisheries
National Development Planning Agency
Panglima Laut
Projek Pesisir Lampung PKSPL-IPM
Research Center for Marine and Fisheries Product Processing and Socioeconomics
Research Institute for Freshwater Fisheries
Research Institute for Marine Fisheries
Telapak Indonesia
The Indonesian Coral Reef Foundation
Universitas Pattimura Ambon
University of Indonesia
University Syiah Kuala of Banda Aceh
Yayasan Hualopu

Iran

International Sturgeon Research Institute
Iranian Fisheries Company (SHILAT)
Iranian Fisheries Research Organization
Persian Gulf University
Tehran University

Israel

Agricultural Research Organization

Japan

National Research Institute of Aquaculture
Overseas Fishery Co-operation Foundation of Japan
System Science Consultants Inc.

Kenya

Department of Fisheries
National Museum of Kenya

Kiribati

Ministry of Fisheries and Marine Resources Development

Lao PDR

Living Aquatic Resources Research Center
National University of Laos
National Mekong Committee
Pakse Southern Agricultural College
Participatory Development Training Center (PADETC)
Regional Development Coordination, Department of Fisheries and Livestock
Science, Technology and Environment Agency, Prime Minister's Office

Madagascar

University Museum
Université d'Antananarivo

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Concern Universal
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Ministry of Agriculture and Irrigation
Ministry of Natural Resources and Environmental Affairs
University of Malawi

Malaysia

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Fisheries Research Institute
Global Environment Center
Lembaga Kemajuan Ikan Malaysia
Ministry of Agriculture
Ministry of Science and Technology
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University Putra Malaysia
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Department of Fisheries
Ministry of Fisheries

Namibia
Ministry of Fisheries and Marine Resources

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Wageningen Agricultural University
WL-Delft Hydraulics

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New Caledonian Provinces (Northern, Southern, Island)

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New Zealand Volunteer Service Abroad
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Ministry of Forests, Environment and Conservation
Department of Fisheries and Marine Resources

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University of Stellenbosch

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Ministry of Fisheries and Aquatic Resources Development
National Aquaculture Development Authority
National Aquatic Resources Research and Development Agency

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Swedish International Development Cooperation Agency
Swedish Museum of Natural History
University of Gothenburg

Taiwan
Academia Sinica

Thailand
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Coastal Resources Institute (CORIN)
Department of Fisheries
Department of Land Development
DNA Technology Laboratory (BIOTECH)
Fisheries Economics Division of the Department of Fisheries
Institute of Social Economic Policy
Kasetsart University
Ministry of Science and Technology
National Aquaculture Genetics Research Institute
Office of Environmental Policy and Planning
Prince of Songkhla University
Southern Marine Fisheries Development Center
Udon Thani Fisheries Development Center

Tonga
Ministry of Fisheries

Uganda
Fish Processors and Exporters Association
Fisheries Resources Research Institute

United Kingdom
British Museum of Natural History
Center for Ecology and Hydrology
Center for Economics and Management of Aquatic Resources
Center for Land Use and Water Resources Research, University of Newcastle Upon Tyne
Department for International Development
Durham University
Fish Gen Limited
IDDRA Ltd.
Imperial College
Macarthur Foundation
Macaulay Land Use Research Institute
University of East Anglia
University of Portsmouth
University of Stirling
University of Wales, Swansea
University of York

United States of America
Auburn University
Duke University
Environmental Protection Organization
Forest Service - U.S. Department of Agriculture
Hawaii Institute of Marine Biology
HLSCC
Locally-Managed Marine Area Network, National Center for Atmospheric Research
National Marine Fisheries Service
National Oceanographic and Atmospheric Research
Natural Heritage Institute
The Nature Conservancy (Latin America and Caribbean Division)
Office of Earth Science, NASA-Johnson Space Center
Oregon State University
Princeton University
Stanford University
State University of New York
Tetra Tech
United State Agency for International Development
University of Connecticut
University of Miami
University of Rhode Island
University of Minnesota
U.S. Sea Grant College Program
U.S. Geological Survey

U.S. Virgin Islands
University of Virgin Islands

Vietnam
An Giang University
Can Tho University
Center for Environmental Research and Education
Committee of the Government on Frontier Issues
Department of Agriculture and Rural Development
Department of Fisheries
Department of Science, Technology, and Environment
Fisheries Resources and Environment Conservation Department, Ministry of Fisheries
Ha Noi Institute of Oceanography
Hai Phong Institute of Oceanology
Hanoi University of Science
Institut Francophone d'Informatique
Institute of Fisheries Economics and Planning
Institute of Oceanography, Department of Marine Living Resources
Integrated Resources Mapping Center
Ministry of Agriculture and Rural Development
Ministry of Fisheries
Ministry of Forestry
Ministry of Planning and Investment
Ministry of Science and Technology and Environment
Nha Trang Institute of Oceanography
National Center for Social Science and Humanities
National University of Hanoi
Nong Lam University (NLU)
People's Committee of Bac Lieu Province
People's Organization of An Giang Province
Research Institute for Aquaculture No. 1
Research Institute for Aquaculture No. 2
Research Institute for Aquaculture No. 3
Research Institute for Marine Products
Royal University of Phnom Penh
Sub-Institute for Water Resources Planning, Ministry of Agriculture and Rural Development
Sub National Institute of Agriculture Planning and Projection
University of Agroforestry
Vietnam Agricultural Science Institute
Vietnam National Mekong Committee

Zambia
Department of Fisheries
Ministry of Agriculture, Food and Fisheries

Zimbabwe
Center for Applied Social Sciences, University of Zimbabwe
Lake Harvest Aquaculture, Ltd.
Lake Kariba Fisheries Research Institute

Regional and International Partners

Regional

Aquaculture for Local Community Development Programme
Arab Organization for Agricultural Development
Asian Development Bank
Asian Institute of Technology
Delegation Française pour la Communauté du Pacifique
Inland Valley Consortium
Institute of Research for Agricultural Development (IRAD)
International Network on Genetics in Aquaculture (INGA)
Lake Victoria Fisheries Organization
Mekong River Commission (MRC)
Network of Aquaculture Centers in Asia-Pacific (NACA)
New Partnership for Africa's Development (NEPAD)
Pacific Rim Innovation and Management Exponents, Inc. (PRIMEX)
Partnerships in Environmental Management for the Seas of East Asia (PEMSEA)
Program for Integrated Development of Artisanal Fisheries in West Africa (IDAF)
Queensland Department of Primary Industries and Fisheries
Regional Organization for the Conservation of the Environment of the Red Sea and the Gulf of Aden
Secretariat of the Pacific Community
Secretariat of the Pacific Regional Environment Programme (SPREP)
SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA)
Southeast Asian Fisheries Development Center (SEAFDEC)
Southeast Asian Regional Center for Graduate Study and Research in Agriculture
Southern Africa Development Community
Technical Advisory Services for Fisheries Products in Asia and the Pacific Region (INFOFISH)
WWF South Pacific Program
WWF Wallacea Bioregion Program

International

Action Aid
African Rice Center (WARDA)
Agricultural Research for Developing Countries (CIRAD)
Australian Center for International Agricultural Research (ACIAR)
Center for International Forestry Research (CIFOR)
Coral Reef Alliance (CORAL)
Coral Reef Degradation in the Indian Ocean (CORDIO)
Crawford Fund
Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)
Economic, Social, and Cultural Council (ECOSOCC)
Food and Agriculture Organization of the United Nations (FAO)
Ford Foundation
GIFT Foundation International
Global Association for People and the Environment (GAPE)
Global Coral Reef Monitoring Network
Icelandic International Development Agency (ICEIDA)
Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER)
International Center for Research in Agroforestry (ICRAF)
International Committee for the Red Cross
International Coral Reef Initiative (ICRI)
International Food Policy Research Institute (IFPRI)
International Fund for Agricultural Development (IFAD)
International Institute of Rural Reconstruction (IIRR)
International Marinelife Alliance
International Plant Genetic Resources Institute (IPGRI)
International Livestock Research Institute (ILRI)
International Rice Research Institute (IRRI)
International Water Management Institute (IWMI)
Jesuit Refugee Service
Marine Aquarium Council
Mercy Corps
National Oceanic and Atmospheric Administration (NOAA)
New Zealand Agency for International Development (NZAID)
Oxfam America
ReefCheck International
The Nature Conservancy
United Nations Children's Fund (UNICEF)
United Nations Development Program (UNDP)
United Nations Environment Program (UNEP–East Asia Regional Seas Programs)
University of Miami – Rosenstiel School of Marine and Atmospheric Science
U.S. Peace Corps
Wetlands International
World Agroforestry Center
World Conservation Monitoring Center (WCMC)
World Conservation Union (IUCN)
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World Wide Fund for Nature (WWF)

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Chinese Academy of Sciences
Beijing, China

Staff Information
As of 31 December 2004

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Stephen John Hall	Director General
Patrick Dugan	Deputy Director General
James K. Oliver	Science Coordination
Khar Hoay Tan	Head – Corporate HR
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Cheng Cheok Lim	Senior Secretary

Administration and Operations Unit

Soo Thai Koid	Facilities Coordinator
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Siew Hua Koh	Administrative Associate
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Puteri Nor Azima Johnny Ismail	Receptionist

Aquaculture and Genetics Improvement

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Hooi Ling Khaw	Research Assistant I

Business Development Office

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Ceres Pasamba	Manager
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Meenalosany Arivananthan	Business Dev. Associate

Business Systems Support Unit

Rainelda Ampil	Manager
Wei Hoong Saw	Analyst Programmer
Saw Ai Tan	Web Developer

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Poh Liew Khor	CSD Associate

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Hun Pin Chee	Accountant I
Ban Swee Tan	Accountant I
Nor Azah Bostam	Accounts Assistant

Financial Planning and Budget Unit

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Human Resources Unit

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Ma. Carmen Anonuevo Ablan	Assistant Scientist
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Amelia Hui Xin Goh	Research Assistant I
Yusri Yusuf	Research Assistant I
Moi Khim Tan	Database Adminstrator

Policy, Economics and Social Sciences

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Madan Mohan Dey	Portfolio Director
Blake D.M. Ratner	Portfolio Director
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Noraini Yaacob	Research Assistant I

Overseas Offices and Field Sites

Bangladesh

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Mohammed Rayhan Uddin	Administrative Assistant I

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Binoy Kumar Berman	Field Coordinator/Researcher
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Mir Mostaque Ahamed	Research Assistant I
Mohammed Abdur Razzaque	Research Assistant I
Mohammed Nazim Uddin	Research Assistant I
Syed Arifuzzaman	Research Assistant I
Mohammed Asadul Hoque	Research Assistant I
Mohammed Zamal Uddin	Research Assistant I
Bibhu Bhusan Mazumder	Research Assistant I

Corporate Services Division

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Mohammed Erfan Ahmed Siddique	Accounts Assistant
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Ripa Chakma	Data Analyst
Ismat Ara	Data Entry Operator
Mohammed Billal Hosain	Data Entry Operator
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Maksuda Khanam	Administrative Assistant I
Sabinoy Chakma	Administrative Assistant I
Mohammed Reazwanul Haque	Administrative Assistant I
Tapan Chandra Sarker	Admin Asst./Messenger
Mohammed Abdul Wahab	Admin Asst./Messenger
Mohammed Mahade Hasan Babul	Admin Asst./Messenger
Mohammed Abdul Karim	Admin Asst./Messenger
Asma Rahman	Receptionist
Anwar Uddin Noor	Driver
Mohammed Anwar Hossain	Driver
Mohammed Mohiuddin	Driver
Mohammed Nazrul Islam	Driver
Mohammed Dulal	Driver
Mohammed Jahangir Alam	Driver

Natural Resources Management

Mohammed Golam Mostafa	Fisheries Resources Scientist
Mohammed Khalilur Rahman	Research Assistant I
Susmita Choudhury	Research Assistant I

Policy, Economics and Social Sciences

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Abdullah-Al Mamun	Research Associate I
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Mahadi Hasan	Research Assistant I
Mohammed Ferdous Ali	Research Assistant I

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Mohammed Abu Taleb Mollah	Field Assistant
Mohammed Kamrul Islam	Field Assistant
Mohammed Mirjahan Ali	Field Assistant
Mohamed Shamsul Alam	Field Assistant
Abdul Hafiz-Al-Faruqi	Field Assistant
Mohamed Mehedi Hasan	Field Assistant
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