WorldFish
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The WorldFish Center
ANNUAL REPORT
2008/09

Reducing poverty and hunger by
improving fisheries and aquaculture

Director General's Statement

WorldFish has two over-arching goals. We call these our Development Challenges. The first is to help small-scale fisheries in developing countries become more resilient and better managed to sustain and enhance their many benefits to the poor and the rural economies they support. The second is to help support the adoption of sustainable fish farming that benefits the poor by providing food and income security and economic opportunity. Meeting both these challenges at scale is an enormous task, but I believe it is possible if efforts by the development community are aligned.

I think of our Development Challenges as jigsaw puzzles. Maximizing development impact requires many pieces to be put in place to complete the picture.

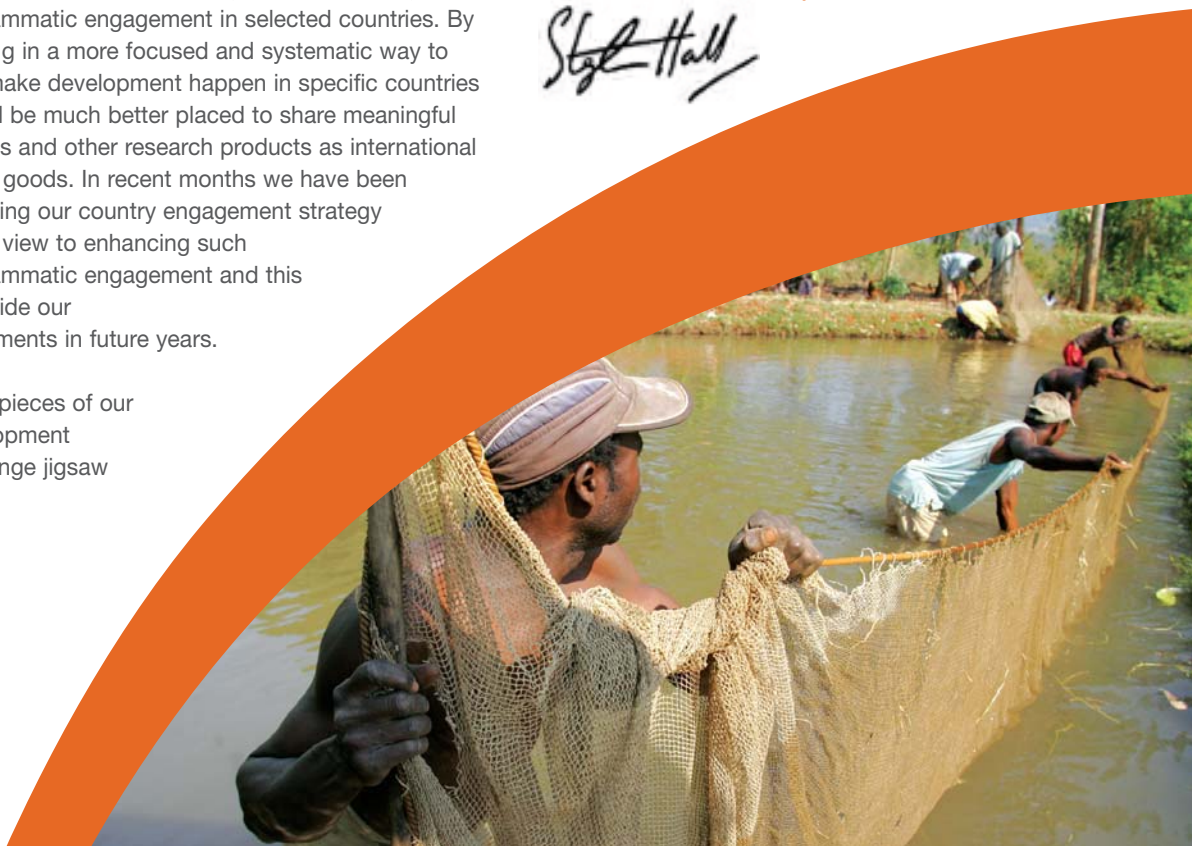
Some of these pieces we and our partners can help with. We are working to improve the management arrangements for small-scale fisheries in several countries and using this as a learning platform from which lessons about what works can be shared globally. Similarly we are working with national agencies in other countries to identify the strategic support needed by government to allow small to medium aquaculture enterprises to flourish. These are examples of what WorldFish must do through our role as a partner that helps bridge from research to action and as a broker of the wider relationships and dialogues needed to help make a development effort work.

If we are to help achieve direct impact at scale, which is what I believe our investors expect of us, we will need to sustain a long term and strategic programmatic engagement in selected countries. By working in a more focused and systematic way to help make development happen in specific countries we will be much better placed to share meaningful lessons and other research products as international public goods. In recent months we have been reviewing our country engagement strategy with a view to enhancing such programmatic engagement and this will guide our investments in future years.

Other pieces of our Development Challenge jigsaw puzzles lie beyond our direct competence or resources. Provision of roads or other services that help fishers and fish farmers to succeed requires investment by others. Here, however, we also have a role as a broker of cross-sectoral dialogue and as a catalyst through global and more local commentary for the needed analysis and investment. This catalytic role is also an area where we are reviewing our approach.

The work described in this report is a testament to the dedication and quality of WorldFish staff and to the contribution to development that their work has made. Looking forward, however, I see appetite for more and an ambition to change up a gear. All of us here want to look back at some future time and point to clear evidence that we helped make development happen and, in doing so we learned lessons that helped others do development better. That ambition requires a sense of urgency that drives purposeful action. It also requires the confidence and support of investors, something I hope this report continues to build.

Stephen J. Hall, Director General



Study identifies countries most vunerable as climate change imperils fisheries

With climate change threatening to ruin coral reefs, push seawater into freshwater habitats and worsen coastal storms, millions of fishery-dependent people could face unprecedented hardship. WorldFish scientists and collaborators on three continents published a study in the peer-reviewed journal *Fish and Fisheries* that identified as most vulnerable Guinea, Malawi, Senegal and Uganda in Africa; Peru and Colombia in South America; and Bangladesh, Cambodia, Pakistan, Vietnam and Yemen in Asia. Vulnerability arises from the combined effect of predicted warming, the relative importance of fisheries to national economies and diets, and limited capacity to adapt.

Several vulnerable countries are at risk from the extreme weather that is predicted to become more frequent and severe with global warming, and many are among the world's least developed and poorest. The most vulnerable countries, which depend on fish twice as much as others for dietary protein and produce 20% of the world's fish exports, have the greatest need to plan their adaption to climate change to maintain or enhance fisheries' contributions to poverty reduction. Although the precise impacts of climate-driven change for particular fisheries are uncertain, the analysis, which was funded by the Department for International Development of the United Kingdom, predicted economic hardship or missed opportunities for development in countries that depend upon fisheries but lack the capacity to adapt.

The necessary responses include developing better weather forecasting and early warning systems and strengthening the capacity of fisherfolk to adapt by reinforcing their existing responses to climate variability and other challenges and diversifying their livelihoods.

Cyclone-affected aquaculture in Bangladesh promptly restored

In November 2007, Cyclone Sidr tore across southern coastal districts of Bangladesh, taking 3,000 lives and leaving hundreds of thousands homeless and destitute. In response, WorldFish led a project, funded by the United States Agency for International Development, to reestablish and enhance the productive capacity of affected fish, shrimp and prawn farms. By partnering with 15 nongovernmental organizations, WorldFish supported the efforts of 46,500 aquaculture households toward restoring their productive potential. The households targeted were the poorest, those headed by women and those most dependent on aquaculture. To get most fish farms up and running in the next aquaculture cycle, the project supplied starter packs consisting of fish fry, prawn and/or shrimp post-larvae and pond management ingredients including lime and fertilizer.

To improve post-disaster intervention strategies, analysis of affected farmers' coping strategies and agency delivery was undertaken. This provided clearer understanding of how institutional support mechanisms, assets, livelihoods, the magnitude of damage and the coping ability of disaster victims jointly affected farms' recovery of productive capacity. The study identified a number of potential improvements to reduce risk and build resilience, which will strengthen aquaculture's contribution to rehabilitating communities affected by disasters. A study of the approaches used by 11 partner nongovernmental organizations determined best practices for post-disaster intervention and developed a tool for selecting partners and identifying specific areas for capacity building during implementation.

Proven aquaculture and fishery knowledge extended to disadvantaged minority communities

About 2 million tribal people in Bangladesh, known as Adivasi, are socially, politically and economically marginalized. Most development efforts either ignore these communities or actually harm them. A project led by WorldFish and funded by the European Commission targeted Adivasi households in 120 communities in northern and northwestern Bangladesh. The aim was to extend to them smallholder aquaculture technology and improved fishery management to increase their fish production, improve household nutrition and income, and provide alternative employment. Having ensured that the chosen interventions suited Adivasi needs, the project built institutional networks and local capacity for managing both the technology and the stakeholder groups it helped form to develop fishery enterprises.

Working with Caritas Bangladesh and the Bangladesh Fisheries Research Forum, WorldFish built on its earlier work in Bangladesh that refined pond and rice paddy aquaculture techniques for smallholders and community fishery management to benefit the landless and other poor rural residents. By end-2008, the project had improved the livelihoods of 3,584 Adivasi households, increasing by four times their income from fish culture in ponds, rice paddies and cages, as well as from habitat restoration for capture fisheries and from aquaculture-related income options such as forming fish-netting teams for hire and trading in fish seed and food fish. The increased income improved the food security of Adivasi households, reducing their food deficit period from 1.8 months in 2007 to 1.2 months in 2008.

Study proposes new framework to assess water productivity in aquaculture and fishery systems

Water productivity is the amount of agricultural output per unit of water consumed. Under the auspices of the CGIAR Challenge Program on Water and Food, WorldFish led a study on the water productivity of aquatic systems. The study established the benefits and limitations of the concept of water productivity in fisheries and aquaculture, defined the scope and conditions of its application, and highlighted further research needs.

A general conclusion is that the concept of water productivity, initially developed for irrigated agriculture and later applied to rainfed agriculture and livestock rearing, applies to fish culture but not to all capture fisheries. It can be applied when water is a limiting factor to aquatic resource production and in confined water bodies, and so may be useful for decisions on allocating water in basins or catchments, but must be developed to fully reflect the social and ecological dimensions of fisheries and aquaculture. The study proposes a revised framework for a pluralistic approach, including socio-ecological assessments and the explicit consideration of trade-offs among the objectives of increased food production, ecosystem conservation and poverty alleviation. This may set the scene for further developing the concept of water productivity for application beyond fisheries and aquaculture.

Project confirms that small fisheries make big contributions to welfare

Small and inland fisheries are often more informal and dispersed than their larger marine counterparts, making them hard to track. The appearance that they are less productive than large fisheries simply reflects our lack information about them, which breeds a lack of understanding and support. In collaboration with the Food and Agriculture Organization and many national partners, WorldFish has recently completed a reanalysis of these fisheries in terms of catch and participation to better guide policy and investment in the subsector.

Preliminary findings are compelling. Over half of the catch in developing countries comes from small-scale fisheries, from which 90-95% of landings are destined for domestic human consumption. This illustrates their contribution to local food security. They also provide over 90% of all fishery jobs, with women accounting for about half of the total fishery workforce in developing countries, both full and part time. Small fisheries also provide food and income to millions of occasional fishers and fishery workers, serving as a security net for poorer populations, especially in coastal areas. Many small fisheries in developing countries are vulnerable to threats both internal and external. Volatile fuel prices constitute a particular concern in this respect, as fuel typically absorbs a major part of the cost of fishing, even in less-mechanized small fisheries.

Fish is foremost in the nutritional dimension of the battle against HIV/AIDS

WorldFish and partners in Zambia are studying the best approach to countering HIV/AIDS with improved nutrition. Evidence is emerging that good nutrition helps prevent or slow the onset of AIDS-related illness in HIV-infected people, partly by improving the efficacy of antiretroviral drugs. Children with HIV are especially responsive to nutritional enhancement. In subequatorial Africa, HIV infection leads to AIDS more quickly than in other regions because of poverty and malnutrition. As fish promises to provide affordable animal protein and micronutrients to people living with HIV, WorldFish and its partners are comparing methods of delivery, supported with funding from the Swedish International Development Agency and the Norwegian Ministry of Foreign Affairs.

Dried fish powder keeps well and is easily transported. Preliminary studies in Lusaka that compared HIV patients that consumed fish with those who did not found that adding 2.5 kilograms of dried fish powder per month to the diet helped nutritional status and wound healing. The cost of this nutritional supplement is less than US$60 per person per year and can be lower using locally caught fish such as kapenta (*Limnothrissa miodon*) or farmed fish. The studies found that fish powder should be added in combination with additional calories to avoid weight loss. The clinical trials in Lusaka analyze the effects of fish and fish powder on the nutritional status and response to antiretroviral therapy of patients in clinics and treated at home and have found preliminary but strong indications that fish powder sustainably improves conditions for people living with HIV.

Newly identified best practices in coral reef management applied in the Philippines

Coral reefs are exceedingly rich in biodiversity and highly productive. They provide goods and services with an estimated value of $375 billion per year. The International Year of the Reef 2008 was an appropriate time to release a comprehensive analysis of major projects on managing and preserving these "rainforests of the sea." WorldFish led an analysis of 30 projects with a combined value of more than $320 million, funded by the Global Environment Facility and 26 others, to translate lessons learned into good practices and information sources that can improve project design and implementation globally. These lessons are being translated into practice in the Philippines which has reefs that are among the most threatened globally.

In March 2008, WorldFish led a series of workshops in the Philippines, which accounts for 26% of all coral reefs in Southeast Asia and includes some of the most diverse reefs in the world. Nearly three quarters of reefs in the Philippines are damaged or threatened by disease, natural disaster, pollution, overharvesting and bleaching caused by global warming. The workshops in three Philippine communities aimed to train managers and stakeholders of marine protected areas in good management practices; select appropriate biophysical, socioeconomic and governance indicators for assessing management effectiveness; understand the process, expected outputs and resource needs to complete an evaluation; and develop a feasible work plan for implementing lessons and measuring indicators at each project site. After validation workshops in the same communities in September determined how useful the indicators were and to what extent the best practices had been implemented, the Philippines agreed to fund the expansion of the training into marine protected areas in the provinces of Quezon, Bohol and Surigao del Sur.

Successful program of genetic improvement of finfish extended to freshwater prawns

WorldFish has expanded its successful program of breeding genetically improved strains of farmed tilapia and carp to include freshwater prawn. *Macrobrachium rosenbergii* is one of the most important crustaceans in inland aquaculture, economically important for the poor because it fits well in smallholders' typical system of prawn polyculture with carp or tilapia in Bangladesh, China, India, Philippines, Thailand and Vietnam. It does not require expensive high-protein feed, thriving instead on locally procured plants, yet it fetches a much higher price than freshwater fish. Demand is high in domestic and export markets alike.The aim is to develop high-yielding strains with good adaptation to environmental challenges and a high survival rate. This is the first attempt to genetically improve this prawn species. Implementation entails collecting and evaluating strains, establishing the foundation population, designing and implementing the selection program, developing strategies for effectively disseminating the improved strain, and building the capacity of local scientists. Selective breeding has begun in India, Malaysia and Vietnam in collaboration with national partners possessing the required facilities and skilled personnel. In all three countries, physical facilities have been consolidated, the technique of family identification using visible implant elastomer mastered, and family production begun following the single-pair mating design. The involvement of the three countries ensures that the project captures their wealth of experience. The project will significantly contribute to understanding of the species' genetics and provide a model for genetically improving other crustaceans.

Don't let fish slip through the climate change net

With over 400 million of the world's poorest depending on fish for food, 'climate-proofing' fisheries and aquaculture needs to be high on the climate change agenda. Yet fisheries and aquaculture are conspicuously absent from the climate change debate, even though science shows that climate change poses huge threats to aquatic food production and the poor who depend on it.

Climate change will impact aquatic ecosystems, and alter the distribution and production of fish. Fish migration routes, spawning and feeding grounds, and fishing seasons are all likely to change, and the impacts on fishing communities and harvests are uncertain. Inland fisheries are particularly vulnerable to reduced rainfall and river flows, a threat that is likely to be compounded by growing demands for water for irrigation and domestic and industrial use.

Extreme weather events will become more frequent, bringing increased risks to coastal fishing communities and aquaculture systems. Farms growing fish and shellfish in coastal Asia are particularly vulnerable and their loss will have dramatic consequences for coastal economies there.

Recent research led by WorldFish has confirmed that the impacts of climate change on fisheries and aquaculture will be felt most acutely in Africa and South Asia. A third of the world's six billion people depend on fish and other aquatic products for at least a fifth of their protein. More than half of the protein and minerals consumed by over 400 million people in the poorest countries of Africa and South Asia come from subsistence and artisanal fisheries. Worldwide, half a billion people depend on fisheries and aquaculture for their livelihoods, and the vast majority of them live in developing countries. In 2008, the global trade in fish and aquaculture products was worth over US$78 billion.

Because of this, WorldFish is working in partnership with other international organizations to ensure that fisheries and aquaculture are on the agenda at the Conference of the Parties to the UN Framework Convention on Climate Change in Copenhagen in December 2009, where the partnership will table a strong sector-wide strategy setting out why fisheries and aquaculture need to be considered and how this can best be done. Leading up to this, WorldFish, the FAO, UNEP and 13 other global and regional organizations have also already highlighted the dangers and opportunities that climate change poses for fisheries and aquaculture at the UNFCCC talks in Bonn this June.

Supporting this policy engagement, WorldFish is building on our previous research on responses of aquatic ecosystems and their dependent people to past climate variability, to help design sound policies and management strategies for fisheries and aquaculture in the face of climate change.

First, we are working to improve our understanding of how climate change threatens communities that depend on fisheries and the magnitude of these threats. Mapping vulnerability to threats will highlight 'hotspots': primary targets for investments in adapting to climate change. **Second,** we are analyzing how fishing communities react to natural disasters and are learning from them. This will help governments, communities and their development partners make realistic plans for the more frequent extreme weather that is expected. **Third,** we are exploring how fisheries and aquaculture can contribute to reducing greenhouse gases. Reducing the carbon footprint of fisheries and aquaculture will be a big step towards environmentally sustainable production. **Fourth,** we are raising the profile of fisheries and aquaculture issues in global, regional and national policy fora where climate change is discussed. We are making sure we take part in key policy processes. And we are making sure that stakeholders know where to go to get both technical and financial support for adapting to climate change.

Undoubtedly climate change poses a huge challenge. We at WorldFish are convinced that high-quality research is an essential investment in climate-proofing our future, and that fish are a vital part of that future. High-quality research involves resource users, builds strong partnerships and harnesses political support. High-quality research is crucial for making fisheries and aquaculture systems more resilient to global climate change. Decisions informed by high-quality research will be key to securing a better future for the poor who depend upon fisheries and aquaculture. WorldFish is deeply committed to generating the knowledge we need to do this.

Chairman's Statement

This reporting period has seen WorldFish continue to position itself well and deliver science that is needed to help reduce poverty and hunger. For me, highlights of the year include the excellent work on Fisheries and Climate Change, which received considerable attention internationally, and the feedback we have had from key partners on our approach to supporting regional development priorities, especially in Africa. These and other examples described in this report convince me that our research and other activities are increasingly effective in helping to deliver development impact and our staff are doing high quality science that matters. I am also encouraged by the congruence between our efforts to better position ourselves as a results focused institution and the expectations for change in the wider CGIAR.

Reflecting on our financial performance in 2008, I believe it was a solid year, but not a spectacular one. At the headline level our income slightly exceeded budget and our working days capital is also higher than budget. Notable among our Key Performance Goal results was a rise to "superior" in World Bank performance rankings and some excellent recruitment has improved our gender and diversity balance. Looking forward we will need continued vigilance and effort to ensure that we sustain the focus and funding needed to deliver on our ambition.

To this end, the start of 2009 has seen considerable effort to further improve performance of WorldFish and to support change in the wider CGIAR. Internally, we have taken a root and branch look at how we work and have identified some key areas where we must focus to ensure that we can meet the challenges ahead. These areas include resolving more clearly our geographic focus and reviewing our research structure, improving our systems and processes and supporting leadership development at all levels. Embarking on these "Must Win Battles" has done a great deal to re-energize staff and re-enforce our sense of purpose. More widely, our Director General has played a key role in the wider change process in the CGIAR. Although this inevitably diverts attention from internal Center issues, the WorldFish Board of Trustees fully supports this effort. We see a re-vitalized CGIAR as key for the future success of WorldFish and look forward to seeing the Center as part of a new and more effective global system.

Ambassador Remo Gautschi
Chairman, WorldFish Board of Trustees

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WorldFish Investors 2008

- African Wildlife Foundation
- Australian Center for International Agricultural Research
- BG Egypt
- Canadian International Development Agency
- Conservation International
- Consultative Group on International Agricultural Research
  - Challenge Program on Water and Food
  - Information & Communications Technology-Knowledge Management
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- Finnish International Development Agency
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- International Fund for Agricultural Development
- International Fund for Agricultural Research
- Israeli Ministry of Agriculture and Rural Development
- IUCN-The World Conservation Union
- Japanese Ministry of Foreign Affairs
- Malaysian Agricultural Research and Development Institute
- Mekong River Commission
- National Geographic Society
- New Caledonia Economic Development Agency
- New Zealand Agency for International Development
- Packard Foundation
- Philippine Department of Agriculture
- Republic of South Africa Department of Agriculture
- Royal Norwegian Ministry of Foreign Affairs
- Sri Lanka National Aquaculture Development Authority
- Swedish International Development Cooperation Agency
- Swiss Agency for Development and Cooperation
- The Force of Nature Aid Foundation
- The OPEC Fund for International Development
- Transnational Consulting, Inc.
- United Kingdom Department for International Development
- United Nations
  - Food and Agriculture Organization
  - United Nations Environment Programme
- United States of America
  - National Oceanic and Atmospheric Administration
  - United States of America Agency for International Development
- World Bank
- World Wide Fund for Nature

Statement of Financial Position

(US Dollar '000)

	As of December 31	
	2008	2007
ASSETS		
CURRENT ASSETS		
Cash and cash equivalents	7,793	9,601
Investments	-	325
Accounts receivable		
Donors	3,526	2,171
Employees	161	123
Other CGIAR Centers	-	3
Others	1,867	887
Other current assets	121	160
Total current assets	13,468	13,270
NON-CURRENT ASSETS		
Property and equipment, net	384	362
Other assets	-	182
TOTAL ASSETS	13,852	13,814
LIABILITIES AND NET ASSETS		
CURRENT LIABILITIES		
Accounts payable		
Donors	2,785	2,623
Other CGIAR Centers	68	313
Others	3,373	1,345
Accruals and provisions	824	1,038
Total current liabilities	7,050	5,319
NON-CURRENT LIABILITIES		
Accounts payable - Employees	642	813
TOTAL LIABILITIES	7,692	6,132
UNRESTRICTED NET ASSETS		
Designated	891	3,046
Undesignated	5,269	4,636
TOTAL NET ASSETS	6,160	7,682
TOTAL LIABILITIES AND NET ASSETS	13,852	13,814

Statement of Activities

(US Dollar '000)

	For the Year Ended December 31	
	2008	2007
REVENUES, GAINS AND OTHER SUPPORT		
Grants	18,650	15,171
Other revenues	675	1,222
TOTAL REVENUES, GAINS AND OTHER SUPPORT	19,325	16,393
EXPENSES AND LOSSES		
Program related expenses	17,760	15,189
Management and general expenses	3,259	2,871
Other losses expenses	938	-
Sub total expenses and losses	21,957	18,060
Indirect cost recovery	(1,110)	(767)
TOTAL EXPENSES AND LOSSES	20,847	17,293
NET DEFICIT	(1,522)	(900)
Net assets beginning of year	7,682	8,582
Net assets end of year	6,160	7,682

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