



The WorldFish Center

USING FISHERIES AND AQUACULTURE TO REDUCE POVERTY AND HUNGER



Photo by: Dominyk Lever

Wild fish stocks remain vital to many national economies and to the day-to-day welfare of millions of people.

In 2000 the Millennium Development Goals (MDGs) helped focus international attention on the plight of the world's poor. Yet with 2015 fast approaching many of the world's poorest and hungriest people are still falling behind. Indeed, even if we halve extreme poverty and hunger by 2015, at least 800 million people will remain poor and 600 million will still not have enough to eat¹.

Adding to this grim picture, 2008 has seen growing international alarm over future world food supplies. Triggered initially by the growing scarcity and rising prices of wheat and rice, this global concern has matured to recognize the need to improve production, not only of traditional staples, but also fisheries, livestock and other food crops.

Fisheries and aquaculture have enormous potential to provide the poor with more food, better nutrition and increased incomes. Already many of the world's poorest billion, particularly people in Asia and Africa, get a substantial portion of the animal protein in their diet from fish. For many of these

people, fish also provides a major source of livelihood. With targeted investment to better manage fisheries and develop aquaculture we can substantially increase these benefits.

Globally, aquaculture has expanded at an average annual rate of 8.9% since 1970, making it the fastest-growing food production sector. It now provides about half of all fish for human consumption. And with half of all wild fish stocks now harvested to full capacity and a quarter over-exploited, we can expect aquaculture's share of fish production to increase further. This can benefit poor people by improving their food security and nutrition, creating jobs, stimulating economic growth and offering greater diversification of their livelihoods.

Although we cannot greatly increase catches from capture fisheries, wild fish stocks remain vital to many national economies and to the day-to-day welfare of millions of people. So it is essential that we sustain current catches

¹ IFPRI, 2007, *The World Food Situation: New Driving Forces and Required Actions*

and grasp opportunities to use the fish we catch better and add to their value. Failure to sustain and make the most of the catch will have profound consequences for the health, income, livelihoods and well-being of poor people in many developing countries.

DEVELOPMENT IMPACT THROUGH RESILIENT SMALL-SCALE FISHERIES AND SUSTAINABLE AQUACULTURE

WorldFish exists to help eradicate hunger and poverty by harnessing the benefits of fisheries and aquaculture. Reflecting this mission and recognizing the potential and challenges of small-scale fisheries and aquaculture, we are focusing our efforts on working with partners to:

- *support the adoption of sustainable aquaculture that benefits the poor;*
- *make small-scale fisheries more resilient and productive.*

FAO projections show that if just 5% of the area suitable for aquaculture in Africa were put to use, enough extra fish could be produced to meet the needs of the growing population to 2020, at current per capita consumption rates.

In plain language, we view *sustainable aquaculture* as aquaculture that:

- Provides food, nutrition and economic opportunities for those most in need of these benefits.
- Produces fish in ways that do not cause present or future environmental problems.
- Uses land, water, food and energy efficiently to deliver the full range of possible benefits.
- Is integrated into national economies to maximize its contribution to improved human well-being.

Similarly, we view *resilient small-scale fisheries* as those that:

- Deliver the fullest possible range of societal and economic benefits they can provide.
- Have stewards with the tools and skills to adapt to climate change, natural disasters, and other changing circumstances, and take advantage of new opportunities such as those arising from trade globalization.
- Have mechanisms in place to ensure that all those whose interests are at stake are represented fairly in decision-making, so that necessary changes are well informed and widely accepted.
- Are governed responsibly so that, at a minimum, fishers always leave enough fish to ensure that fish populations can be sustained over the longer term.





Photo by: Chris Bene

We estimate that \$15 million invested in small-scale fisheries across nine sub-Saharan countries would benefit 1.25 million fishing-dependent families by 2015.

Viewed in these terms sustainable aquaculture and resilient small-scale fisheries offer an attractive focus for investment to achieve development impact. Maximizing this impact requires investment not only by WorldFish, but by many different players at national, regional and international levels.

The potential for impact is high. In sub-Saharan Africa alone we calculate that an investment of \$40 million spread over ten target countries² could improve yields and income of over half a million fish farmers by 2015. Net farm revenue could be increased by \$500 million a year and annual fish production increased by 260,000 tons. The impact is greater still when the poor consumers who benefit from the increased supply of affordable fish is included. More broadly, by scaling these efforts up and out through joint action, as many as a billion of the world's poorest people can be provided with a more reliable source of food and improved nutrition. It can also give many of them a new means of livelihood.

Similarly, we estimate that \$15 million invested in small-scale fisheries across nine sub-Saharan African countries³ would benefit 1.25 million fishing-dependent families by 2015. A further investment of \$30 million would improve the income of a million women entrepreneurs who trade in fish, with a net revenue increase of \$1.2 billion a year by 2015. With the right investments in small-scale fisheries, we believe that we can improve food and economic security of up to 20 million poor people by 2015.

DECIDING WHERE TO FOCUS: TARGETING INVESTMENTS IN AQUACULTURE AND SMALL-SCALE FISHERIES

As with all development entry points, realizing the potential of aquaculture and fisheries will not be easy. With multiple pathways to impact and opportunities for investment the potential for dissipating effort and resources is high; strategic analysis is essential. To help understand where WorldFish should target its own efforts we have developed “impact roadmaps” for both small-scale fisheries and sustainable aquaculture. These maps set out the multiple pathways to building sustainable aquaculture and resilient small-scale fisheries and the relationships between them. They show clearly how achieving substantive impact requires interventions not only in science, but across the entire research-to-development spectrum. Policy changes, increased infrastructure, stronger institutions, better governance and management approaches, new scientific knowledge – we need them all. And meeting these needs demands investments of time, effort and money by many players - often from those outside the fisheries and aquaculture domain.

² Cameroon, Democratic Republic of Congo, Ghana, Malawi, Mali, Mozambique, Nigeria, Senegal, Uganda and Zambia.

³ Democratic Republic of Congo, Ghana, Malawi, Mali, Mozambique, Nigeria, Senegal, Uganda and Zambia.

Figure 1. The basic structure of an impact roadmap for development

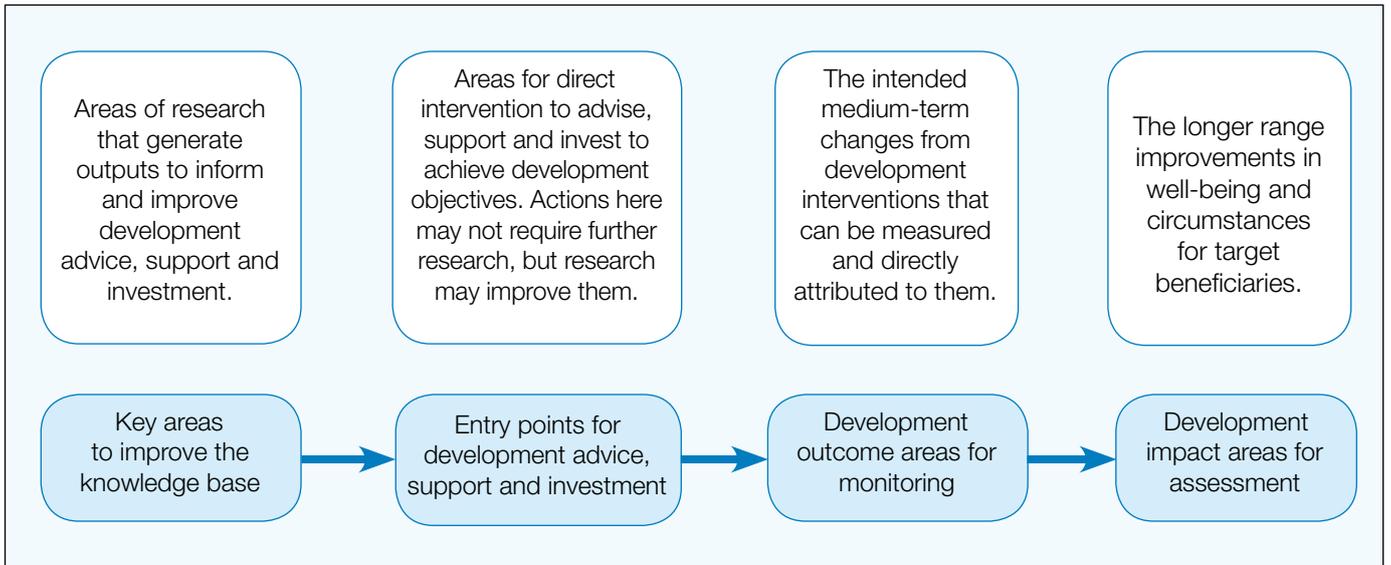
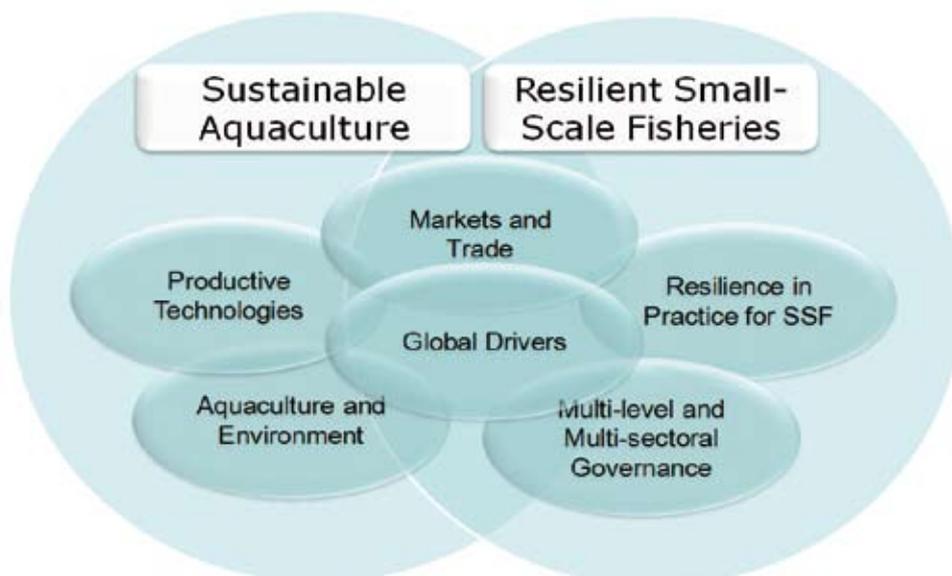


Figure 1 shows the generic structure of a roadmap for development. On the right are desired outcomes and impacts; on the left are the various investments and actions needed to achieve the intended results. Figures 2 and 3 (pages 6 and 7) show the roadmaps themselves. Viewed as a whole, these road maps illustrate multiple inter-linked pathways for achieving development impact through resilient small-scale fisheries and sustainable aquaculture. They do not, however, present a recipe for success, nor a set of fixed ideas about what must be done to meet the development challenges before us. Rather, they provide a framework that we and our partners, investors and stakeholders can use to visualize the outcomes we are seeking to achieve and the various options and trade-offs entailed in getting there. Used in this way, and asking specific questions of specific situations, these impact pathways provide a powerful tool to target investment and increase impact.

THE WORLD FISH RESEARCH PORTFOLIO

Recognizing the complexity and the scale of the challenges faced, we have used the impact roadmaps to assess where WorldFish should focus its research efforts and partnerships to have the greatest impact on hunger and poverty. Working through these comprehensive assessments of impacts, outcomes and interventions we have used the far-left columns to set out the six focal areas where we will direct WorldFish research (Figure 4). These are areas where we believe we can best support development-oriented interventions by providing knowledge, tools, models or other products that can help most to bring about needed changes and improvements. Other research institutions may choose to concentrate on different areas that also warrant attention and are more in line with their own expertise and resources.

Figure 4. Diagram showing six interlinked focal research areas



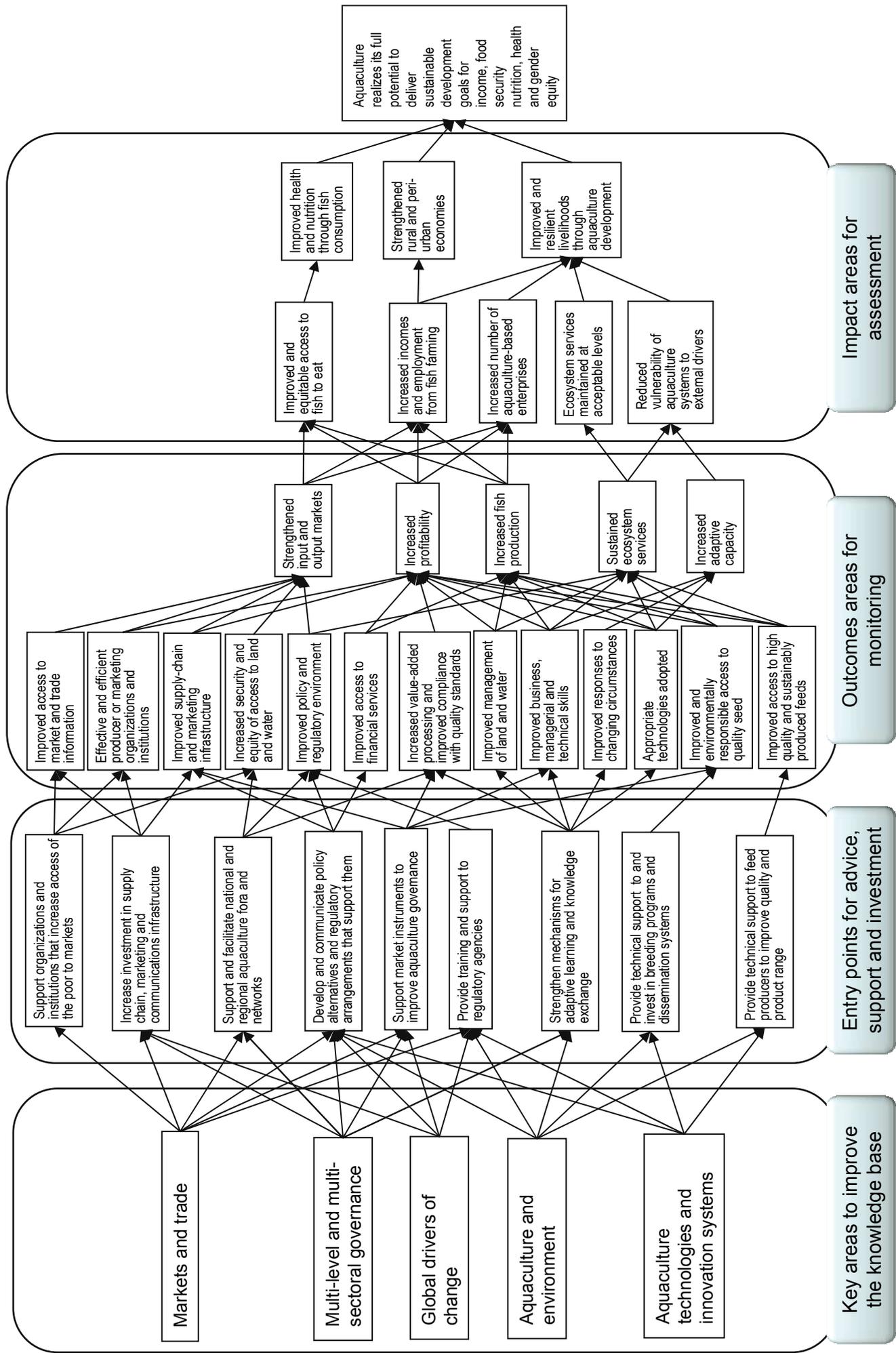


Figure 2. Impact roadmap for sustainable aquaculture

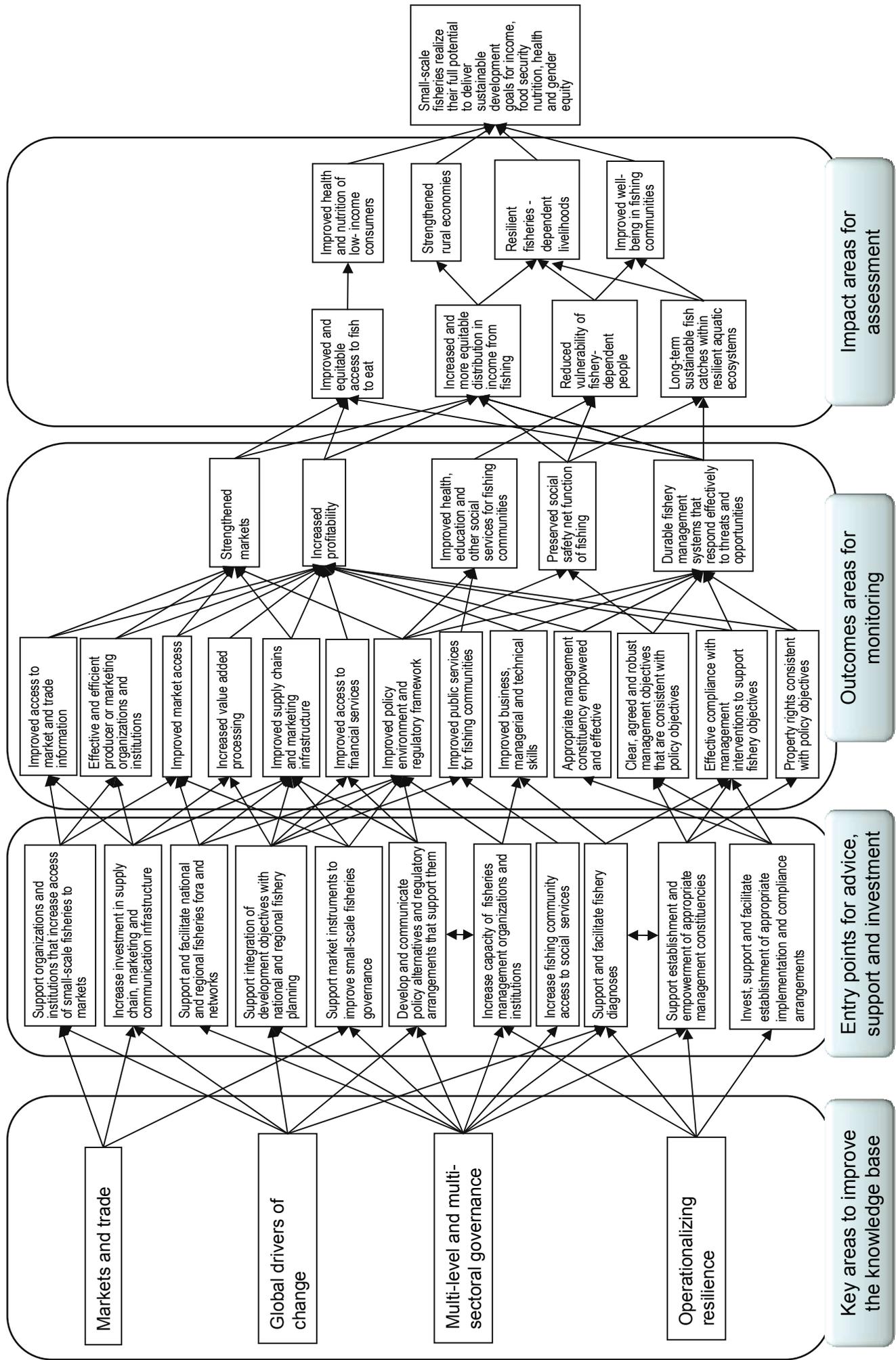


Figure 3. Impact roadmap for small-scale fisheries (SSF)

Table 1. Summary of WorldFish focal research areas

Focal Area	Guiding research question	Rationale	Examples of outputs
<p>Global drivers</p> 	<p>What global forces are affecting fisheries and aquaculture in developing countries and how can they best be coped with?</p>	<p>Development challenges in fisheries and aquaculture are shaped by complex political, social and environmental trends. We must identify, understand and plan for their effects.</p>	<ul style="list-style-type: none"> • Global analysis of impacts of climate change. • Analysis of demographic impacts on supply and demand.
<p>Markets and trade</p> 	<p>How can we increase the benefits to small scale producers from regional and global market integration?</p>	<p>Enhancing trade is one of the best ways to reduce poverty. Helping small-scale producers participate in and benefit from improved access to markets for their products can deliver large scale development impact.</p>	<ul style="list-style-type: none"> • Analysis of barriers to entry by small scale producers. • New public private partnership models to address market constraints.
<p>Multi-sectoral and multi-level governance</p> 	<p>How do we best integrate small-scale fisheries and aquaculture into local, national and global development priorities?</p>	<p>A key challenge for both small scale fisheries and aquaculture is indifference and neglect by governments. Greater inclusion of these sectors into policy is a key to sustaining and enhancing their development impact.</p>	<ul style="list-style-type: none"> • Policy briefs and analysis of key policy processes. • Improved valuation of small-scale fisheries and aquaculture.
<p>Sustainable aquaculture technologies</p> 	<p>How do we increase productivity, resilience and development impact from small and medium scale aquaculture?</p>	<p>For aquaculture to grow sustainably and meet its potential for food and income, we need improved seed and feed technologies and dissemination mechanisms. We must also improve water and land use efficiency and minimize wastes.</p>	<ul style="list-style-type: none"> • Improved seed and seed dissemination mechanisms. • Improved feeds and production guidelines.
<p>Aquaculture and environment</p> 	<p>How can aquaculture make better use of water, land and other resources and minimize its impact on the environment?</p>	<p>There is a risk that unmanaged expansion and intensification of aquaculture will place unsustainable demands on the environment and worsen inequities. We need better policies, risk assessment approaches and tools for analyzing trade-offs to manage these risks.</p>	<ul style="list-style-type: none"> • A framework and tools to assess water productivity in aquaculture. • Tools for managing risk from use of genetically improved strains.
<p>Resilience in practice</p> 	<p>How do we improve small-scale fisheries management and make fisheries systems better able to cope with external shocks?</p>	<p>A new view of sustainability in fisheries is emerging, but advances in theory have yet to translate into practice. We need new approaches for assessing and managing small scale fisheries, and for diversifying livelihoods of those dependent on fisheries.</p>	<ul style="list-style-type: none"> • Improved methods for integrated assessment and advice for small-scale fisheries. • Analysis and testing of livelihood diversification approaches.



Photo by: Fern Com

For aquaculture to grow sustainably and meet its potential for food and income, we need improved seed and feed technologies and dissemination mechanisms.

Table 1 (page 8) summarizes the rationale and our research agenda for each of these key areas. Our *Medium-Term Plan*⁴ gives a more complete description of our project portfolio and includes detailed information about intended impacts, potential partnerships, congruence with research priorities of the Consultative Group for International Agricultural Research and opportunities to produce international public goods. It also discusses cross-cutting issues such as gender analysis, capacity-building, impact assessment, and communication and policy linkages.

MAKING IT HAPPEN – PARTNERSHIP FOR ACTION

Partnerships are central to the WorldFish Strategy. This is reflected in our desire “to be the science partner of choice for delivering aquaculture and fisheries solutions for developing countries”. Our strategy, which explicitly recognizes the roles of different types of institutions and their contributions to fisheries and aquaculture, reflects our understanding that the Center cannot alone achieve the challenges facing fisheries and aquaculture. We need, and will continue to seek, partners in research, partners to help us engage more effectively in policy processes, and partners to help us achieve impact on the ground.

⁴ http://www.worldfishcenter.org/resource_centre/WorldFish%20Medium%20Term%20Plan.pdf



Photo by: Chris Berne

Local marketing and value-addition, typically by women, creates further value and income opportunities for the poor.

We need these partnerships to help us work at a global level, but also in the key geographic regions where we will concentrate our efforts. These are: Africa, which has the most pressing need for the kind of knowledge and technologies we can provide; Asia, which has large numbers of poor people who depend heavily on fisheries and aquaculture for food and nutrition; and the South Pacific, where poverty levels are high and there are few alternatives to fisheries-based livelihoods. Within each of these regions we will focus most of our effort on those countries where we believe there is the greatest opportunity to generate impact and through this develop the learning and research products that constitute

Many countries in the South Pacific have high levels of poverty and few alternatives to livelihoods provided by aquatic resources, so WorldFish actively pursues development options in both fisheries and aquaculture, such as oyster farming in the Solomon Islands.



Photo by: WorldFish

the international public goods from which other countries and regions can benefit.

In these few pages we have tried to show fisheries and aquaculture as key drivers of development impact and have laid out pathways for achieving this. Achieving resilient small-scale fisheries and sustainable aquaculture will require effort and commitment by many to work along those pathways and we will make mistakes along the way. But we are confident that, working together, we can make it happen and are committed to doing our part. We look forward to working with others who choose to join us on the journey.

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