

Introduction

Fish is an important food for over 400 million Africans, contributing essential proteins, minerals and micronutrients to their diets. Paradoxically, despite the high dependence on fish as a source of animal protein (Fig 1.), fish consumption in sub-Saharan Africa is the world's lowest. The continent is projected to need an additional 1.6 million tons of fish a year by 2015 just to maintain current consumption. This demand will increase by a further 2.6 million tons a year by 2030. Most wild capture fisheries, however, have reached their production limit or are over-fished. The rapid increases in fish supply required over the next decades will only be possible, therefore, if these fisheries are sustained and improved, while simultaneously developing aquaculture (fish farming). This note summarizes this dual approach.

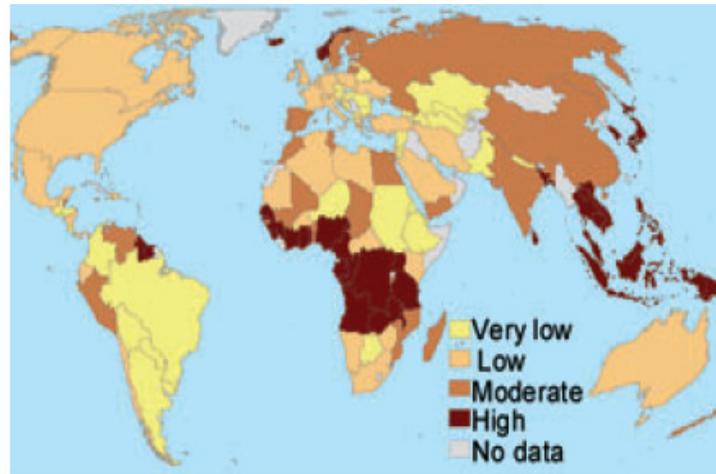


Figure 1. The global pattern of fish protein consumption as a proportion of total animal protein in national diets. Colours represent quartiles: Dark Brown = Upper Quartile (23 - 84% of total protein), Mid Brown = Upper middle quartile (12 - 23%); Light Brown = Lower middle quartile (5 - 12%); Yellow = Lower Quartile (0.5 - 5%). Grey indicates countries where no data were available. Source Allison et al (2009)

Where to focus

Africa has extensive marine fisheries that are exploited by foreign commercial fleets. However these catches are destined for export and play little role in meeting the continent's food needs. Rather, it is the small-scale coastal inshore, and inland freshwater, fisheries that provide most (> 90%) of the fish consumed across the continent.

Continent wide, over 2.5 million people are involved in fishing and three times this number in trading and processing. However, while all countries in Africa have some small-scale fisheries, they are most important along the coasts of west and southern Africa and in the basins of the Senegal, Niger, Volta, Congo, Lake Chad, Nile, and Zambezi river systems.

Aquaculture development in Africa has lagged far behind that seen in Asia. It currently produces less than 5% of Africa's fish. Over the past decade, however, growing demand, the availability of suitable technologies and growing capacity has produced aquaculture success stories in several countries. In Egypt, for example, aquaculture production has grown 10 fold since the 1990s. In Uganda production grew at an average of around 142% annually between 2004 and 2006. In Mozambique, Malawi and Nigeria over the same period, annual growth rates were 62%, 43% and 39%, respectively.

All African countries have fisheries and most have aquaculture potential and many could benefit from the investments described below. In the interests of focus, however, analysis by the WorldFish Center has identified ten countries in Africa where development of fisheries and aquaculture provide particularly strong opportunities for improving food security and generating income. These, together with relevant data on poverty and malnutrition are listed in Table 1.

Table 1: The challenge: Poverty and malnutrition in target countries

Country	Population (millions)	Population under-nourished (millions)	Children under 5 mal-nourished (millions)	Fish dietary protein/ Animal protein (%)	Population (millions)		Target country for	
					< \$1 a day	< \$2 a day	Aqua-culture	SSF
Cameroon	16	4.3	0.5	32	2.7	8.0	✓	
DR Congo	54	40.5	3.6	43	n/a	n/a	✓	✓
Ghana	22	2.6	0.7	66	9.9	17.2	✓	✓
Malawi	12	3.9	0.5	31	5.1	9.1	✓	✓
Mali	13	2.7	0.8	15	9.4	11.7		✓
Mozambique	19	10.1	0.8	22	7.2	14.8	✓	✓
Nigeria	130	10.4	6.5	34	91.0	117.0	✓	✓
Senegal	12	2.9	0.4	43	2.6	7.6		✓
Uganda	27	5.1	1.4	33	11.9	21.3	✓	✓
Zambia	11	5.5	0.5	23	7.1	9.6	✓	✓
<i>Total</i>	<i>316</i>	<i>88.0</i>	<i>15.7</i>		<i>146.9</i>	<i>216.3</i>		

Sources: UNDP 2006; UNICEF 2007; Allison et al (2009)

What to focus on.

Aquaculture and small-scale fisheries offer specific opportunities to grow Africa's rural economy and reduce hunger and poverty. Each sub-sector has its own target group, scope for impact and strategies for investment. These opportunities are summarized below.

Small-scale fisheries

For the foreseeable future the bulk of fish in African markets will continue to come from small-scale fisheries. This is especially true for affordable fish products for the poor. It is a key priority in the fight against malnutrition in Africa to first safeguard, and second increase, this supply of highly nutritious food to vulnerable populations. Achieving this requires investments to 1) sustain small-scale fisheries and 2) improve market chains.

Sustaining small-scale fisheries. Africa's coastal and inland aquatic resources are under major pressures from changes in land and water management. These, together with the intense fishing pressure in most areas, mean that sustaining the continent's small-scale fisheries is one of the major challenges in the fight to improve Africa's food security and livelihoods. It is also a challenge for which no single technical solution exists. Rather, it requires focused on the ground engagement for target fisheries to craft new solutions that will work for a given context.

To these ends, investment is needed to refine and test management tools for improved small-scale fisheries management based on the concept of resilient fishing communities and their fisheries resources. This needs to be done through participatory processes that engage management authorities and community organizations.

Improve market chains to increase the benefits from small-scale fisheries. Over 25% of fish caught and landed in Africa never makes it to the mouths of consumers. It remains unsold, it spoils due to poor handling and transportation, its nutritional benefits are diminished by poor processing, it is contaminated by bacterial and fungal infections, or it is eaten by insect pests. Improved fish processing and marketing technologies can reduce these post-harvest losses by more than 50% and increase the economic and nutritional value of fish products. This will increase the incomes of women's micro-businesses and the food security of low-income consumers. If 50% of the region's artisanal fish trade benefits from these innovations, this will result in additional economic value of at least US\$ 350 million a year and in 350,000 tons of additional fish delivered to the poor, capable of providing 35 million consumers with 10kg of fish a year.

Examples from around the region testify to the impact of simple improvements in post-harvest technologies. In Mali, screens against insects and improved smoking kilns have reduced post-harvest losses from 30% to 10% of harvest. In Uganda, drying small fish on elevated wire-mesh trays rather than on the ground has reduced losses by 40%. In Nigeria, improved 'chorkor' smoking kilns can save up to 87% of processing costs over conventional smoking methods.

These technologies can be disseminated much more widely and benefit the majority of micro-enterprises. As a rule, more decentralized processing closer to the point of production improves quality, reduces transport losses and gives higher prices at market. But the methods need to be adjusted to local circumstances and business practices and the benefits monitored. Extent of mobility, distances to markets, fish species and preferred products are all factors that affect the suitability of particular technologies and the needs for adaptation.

Through improved contractual links to wholesalers and retailers further down the marketing chain, women processors and traders can access higher-value markets and realize higher returns on their investments. Improved links can also increase predictability and security for these often young businesses. Facilitating access to these markets is therefore an important priority. In Uganda, commercial fish exporters are exploring new modalities to link to small-scale traders for certified fish supplies to high-value export markets. As a result, micro-businesses in remote fishing areas of Lake Kyoga in Northern Uganda now have stable incomes. Lessons from such successful innovations can be replicated in other inland and coastal fisheries where commercial exporters rely on artisanal fish supply chains and where in many cases fishing communities and women traders do not realize significant returns from their efforts.

Aquaculture

Analysis of success in African aquaculture development has shown that fish farming expanded rapidly when relevant technical knowledge was available and applied in an economic, institutional and policy context that was conducive to technology uptake and extension. In other words, aquaculture moved beyond small scale isolated successes to have a wider provincial or sub-national impact when a specific set of circumstances were met. The challenge now is to support the further development of these successes and replicate them in other countries. We propose two major approaches to doing this 1) support development of small and medium aquaculture enterprises and 2) support pond culture on small-holder farms.

Increasing the development of small and medium aquaculture enterprises. The experience of African aquaculture development has shown that fish production only begins to have an impact on national fish supply where conditions foster the emergence of small and medium aquaculture enterprises. Where input and output markets are strong and the required technologies and expertise have been available, entrepreneurial farmers have seized the opportunity to specialize in fish production. To build upon these successes greater investment is needed to continue to develop and disseminate improved pond production technologies, together with improved seed and feed. Similarly investments to improve markets and remove barriers, together with knowledge support and capacity building, and development of the necessary regulatory frameworks and other institutional mechanisms, are required. Programmes of investment that provide this support can however provide the catalyst required to support emergence of a sustainable aquaculture sector.

Supporting the development of farm pond aquaculture. Where input and output markets are weak, but environmental conditions for aquaculture are good, the adoption of farm ponds as a mean of diversifying and improving farm productivity has shown to be very successful. While these improvements have no discernible impact on national food supply they do have a substantial impact on household food security and are especially important in times of drought. For these reasons there are substantial benefits to be gained through integrating fish ponds into farming systems over large parts of

Africa. As for SME aquaculture this process needs to be supported by the development and dissemination of improved pond production technologies, improved seed and feed, and provision of effective extension. In contrast to SME aquaculture the sustained provision of these inputs will require long term subsidies. We believe that this is an appropriate development investment in support of small farm producers.

Further Details

Further details on the levels of investment needed and potential impacts can be provided on request. An indication of the scale of return, however, is provided by the extract below from a recent International Food Policy Research Institute analysis.

Ensuring productive and resilient small-scale fisheries—One billion people rely on fish as their primary protein source and several hundred million people depend on fish as their main source of income. Small-scale fisheries (SSFs) provide two-thirds of the global fish catch and more than 95 percent of employment in fisheries. To sustain SSFs and enhance their benefits, threats to fisheries (including from water management, climate change, and overexploitation) need to be identified and addressed. Improved governance and effective benefits sharing through community-based fishery management and equitable contracts, especially through trade associations, are also essential. Better processing and marketing technologies can slash post-harvest losses by more than half, generating US\$350 million and ensuring that 350,000 tons of additional fish will reach the poor. Improvements in marketing and market chains, expanded knowledge of business development, and market information and quality controls can boost the income of women in the fish trade. By 2015, a US\$20-million investment to sustain small-scale fisheries in nine Sub-Saharan African countries plus Bangladesh, Cambodia, Indonesia, Laos, and India would benefit 1.5 million fishing families; US\$29 million more would improve the income of a million women entrepreneurs who trade in fish, with a net revenue increase of US\$1.2 billion. **[Total investment: US\$73.5 million. People reached: 32 million].**

Extract from: International Agricultural Research for Food Security, Poverty Reduction, and the Environment: What to Expect from Scaling Up CGIAR Investments and “Best Bet” Programs. IFPRI (2008)



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