



Development strategies and options for fisheries and aquaculture in Asia

RECOMMENDATIONS

- Rationalize policies to reduce dependence on capture fisheries and sustain them
- Alleviate poverty through community-based fisheries management to develop inland capture fisheries
- Develop aquaculture to meet growing demand for fish
- Focus on freshwater aquaculture for poverty alleviation
- Manage brackish and marine aquaculture to spread benefits and protect the environment
- Facilitate the supply of high-quality aquaculture inputs
- Improve postharvest, processing and marketing services
- Build the necessary institutions

INTRODUCTION

Declining fisheries have hurt many poor coastal and inland fishing communities and consumers in Asia, where 630 million people live on less than US\$1 per day. Developed to restore dwindling fish supplies are the AsiaFish model and recommendations from its associated study, *Strategies and options for increasing and sustaining fisheries and aquaculture production to benefit poor households in Asia*. These are used by Bangladesh, China, India, Indonesia, Malaysia, Philippines, Sri Lanka, Thailand and Vietnam to develop strategies, national action plans and options for sustaining and increasing fish supply.

A partnership of 35 institutions, the AsiaFish model allows countries to make projections on supply and demand for cultured and wild fish up to 2020 — information that is vital where fish supplies both foreign exchange and basic sustenance. The nine participating countries account for

more than a third of the global fish catch and over 84% of world aquaculture output.

Past literature on fish and food security tended to aggregate fish into broad categories or even as a single commodity, obscuring tremendous heterogeneity and blunting analyses' usefulness for designing poverty programs. Past field research focused on resource assessment and biological productivity in fisheries and aquaculture, neglecting data on subsistence production, consumption and local sale. Yet, information on the supply and management of land, water, feed and other inputs, in both the commercial and subsistence sectors, is critical to assessing the long-term prospects for aquaculture and fishery production. Specific and comprehensive analyses of production, farming systems, fish technologies and markets are essential for evaluating options and designing strategies that favor poor fishers and fish farmers.

The AsiaFish model is unique in combining information about fish-related biological resources and market conditions in a format that allows the data to be disaggregated according to different conditions and regarding the impact of policy options on various income groups.

Demand for fish will continue to grow along with rising populations and per capita incomes. If this demand is not met by growing supplies, the resulting scarcity of fish will mean declining consumption of this essential source of high-quality nutrition for Asia's poor, thereby posing a threat to food security.

POLICY RECOMMENDATION 1: Rationalize policies to reduce dependence on capture fisheries and sustain them

Asian capture fisheries have either reached their production limits or are quickly approaching them. Especially in marine inshore areas and inland fisheries, policy should aim to sustain the productivity of natural stocks through prudent management. While subsidizing capture fisheries promotes overfishing, a subsidy that focused instead on environmentally friendly fishing gear would contribute to sustainability.

Some offshore capture fisheries offer scope for significant increases in fishing effort, investment and production, and the poor stand to benefit by working aboard offshore fishing vessels and at landing sites and processing. Coastal capture fisheries, on the other hand, should be managed to reduce capacity and employment, and so restore the health of natural stocks. Gear regulation can reduce wasteful by-catch — and prohibitions against blasting and cyanide fishing demand enforcement — but it must also be recognized that inshore fishing needs to be drastically reduced. This requires that fishers leave the industry. To absorb exiting fishers and minimize economic dislocation, aquaculture, fish processing and tourism (including sport fishing) should be promoted through credit schemes, training programs and other measures.

For the remaining fishers, stronger and more effective management measures are required. Management options vary from decentralization and co-management to centralized, command-and-control administration, but the bottom line is to improve the formulation and enforcement of fishing rules. Promoting the use of such small-scale gear as gill nets and hook-and-line tackle benefits poor fishers.

POLICY RECOMMENDATION 2: Alleviate poverty through community- based fisheries management to develop inland capture fisheries

Though information on their economics is unavailable in systematic form, inland capture fisheries are undoubtedly important for their contributions to the nutrition and livelihood of the rural poor, especially the landless. While significant growth prospects for inland fisheries exist in only a few countries, establishing community organizations for managing common areas is a promising way to deliver benefits to the poor. Research priorities are the evaluation of various types of fishing gear and of management options. An important option for inland fisheries that is rarely viable in the marine environment is stock enhancement.

POLICY RECOMMENDATION 3: Develop aquaculture to meet growing demand for fish

Growth in aquaculture arises through a combination of productivity improvement and area expansion. Productivity improvement is pursued through investments in research and development, as well as through extension and technical support to close the efficiency gaps that stymie production on small-scale, less-intensive farms. Fish supply from aquaculture can be further enhanced by price incentives or increasing the area and intensity of the culture systems. New technologies will continue to have a strong impact on aquaculture production, especially those technologies that are scale neutral and so can improve yields for extensive farmers. For example, if properly planned and managed, genetically improved tilapia (GIFT) can greatly improve yield, regardless of the scale or intensity of the operation. With increasing demand by all economic sectors on environmental services such as the provision of clean water, however, sustained growth of aquaculture will increasingly require it to be mainstreamed into coastal zone and watershed development plans.

POLICY RECOMMENDATION 4: Focus on freshwater aquaculture for poverty alleviation

Delivering the benefits of aquaculture growth to the poor entails prioritizing commodities consumed by them and refining technologies adopted by enterprises that are operated by or employ them and connecting them to input and output markets. The commodities must have a favorable market

outlook to ensure economic viability and return on investment. On this score, low-value freshwater aquaculture and integrated aquaculture-agriculture systems rate highly. Carp is a high priority, as are other major species such as tilapia.

The effect on incomes of measures to promote freshwater aquaculture depends on the intensity of the systems promoted. A policy that does not discriminate may see gains accruing mostly to the richer farmers who can afford to invest in intensive practices. Measures that favor extensive and semi-intensive systems, however, stand to generate more equitably distributed benefits. Even the landless can benefit from aquaculture expansion and productivity growth through employment. Freshwater fish farms typically pay about 30% of their costs for labor, much of it unskilled.

While intensive systems are already close to their efficiency frontier, simply improving farm management and extending the use of more efficient practices in semi-intensive and extensive systems offers great scope for expanding production.

POLICY RECOMMENDATION 5: Manage brackish and marine aquaculture to spread benefits and protect the environment

Brackish water and marine aquaculture offer high economic returns, particularly from exports. However, investment requirements tend to be greater per hectare than for freshwater systems, such that poor, small-scale farmers are often shut out. Promoting marine and brackish water technologies, as currently practiced, therefore generates export revenues and benefits for the industry but contributes little to food security or poverty reduction. Designing collective arrangements to facilitate the participation of small-scale growers and landless workers in brackish water and marine production may help distribute the benefits from export-oriented growth. Adverse environmental impacts can be prevented by incorporating aquaculture within planning legislation at the appropriate watershed and coastal zone scale. Impacts can be mitigated by enforcing regulations on waste products and effluents, and by reducing input requirements through selective breeding of genetically improved strains, and by biotechnology and research to reduce the fish component in feed.

POLICY RECOMMENDATION 6: Facilitate the supply of high-quality aquaculture inputs

A major input constraint on aquaculture is the low availability of high-quality fish seed. Developing the seed industry

would help close efficiency gaps in fish farming and therefore complement technology options applicable for grow-out aquaculture. Hatcheries are profitable but prone to poor management, so systematic extension programs for hatchery operators may contribute greatly to the development of well-managed hatcheries that can produce quality seed. Another reason for poor seed quality is the genetic deterioration of broodstock. Maintaining the quality of broodstock is a highly technical operation. Policies that promote increased and sustained investments in broodstock management operations, which will likely come from the private sector, would indirectly relax constraints on the growth of grow-out aquaculture.

POLICY RECOMMENDATION 7: Improve postharvest, processing and marketing services

Traditional postharvest practices are wasteful and result in finished products of poor quality. Investment is needed in postharvest facilities, training fishers and processors, and building up processing enterprises to meet higher quality standards. Upgrading traditional methods of preservation and processing, such as icing, drying and salting, is a technological priority.

Processing for export faces a major obstacle in the form of global food safety standards. The options open to policymakers are to do nothing and risk exclusion from lucrative foreign markets, or else promote compliance. As long supply chains make food preservation and standards compliance costly for individual producers, policies that encourage small-scale operators to form collective arrangements promise to contribute greatly to sharing the benefits of export-oriented growth.

Inefficiencies and limited competition in marketing need to be addressed. Price policies, particularly on tariffs for imports, may require reconsideration. Tariff reforms may harm some fish subsectors but be beneficial on the whole to food security and sector growth.

POLICY RECOMMENDATION 8: Build the necessary institutions

An effective support system depends heavily on human resources. Marine biologists, oceanographers, breeders, biotechnologists, nutritionists, food technologists, social scientists, and environmentalists are needed to support the anticipated growth of aquaculture. With the global trend toward ethically sound, traceable and environmentally

friendly production systems — and with international markets imposing stringent hygiene standards — demand for specialized services will increase. At present, expertise is lacking, and few universities in the region provide high-quality training.

The surge in aquaculture and the need to conform to stringent international regulations and requirements demands that countries establish a one-stop administrative center to provide guidance on all fisheries matters, from production to international trade. Such a center could take the initiative in product standardization and serve as the coordinator of fishery institutions, processor of stakeholder needs, provider of industry information, and depository for fisheries data.

Micro-finance programs for small-scale aquaculture and alternative enterprises for fishers promise to have a strong and lasting impact on poverty alleviation, as many of the poor are willing and able micro-entrepreneurs if given access to credit, savings and insurance schemes. Organizing poor fishers, farmers and processors is the preferred option for handling developments in global trade and technological change that tend to favor large-scale operations.

Greater regional collaboration, particularly regarding trade negotiation, can counter the arbitrary imposition of non-tariff barriers and protectionist measures in developed countries, as well as harmonize procedures and standards in South-South and North-South trade.

CONCLUSION

To optimize poverty reduction, top priority should be accorded to freshwater fish farmers, inland fishers and small-scale marine fishers. Expanding fish supplies will have to come through

farmed rather than captured fish. Significant expansion in production to meet growing demand and to widen livelihood opportunities can be sought only in aquaculture.

Fish production exists in the wider economic context of a supply-and-value chain beginning with inputs and extending through postharvest services, processing and marketing. Although constraints to growth lie up and down the chain, administration, input delivery and marketing infrastructure have so far received little attention from planners and are generally at rudimentary stages of development. A major impediment to growth, particularly for aquaculture, is the inadequacy of the input delivery system for credit, fingerlings, feed and fertilizers. Downstream producers and traders are plagued by primitive infrastructure and weak links in a long supply chain. Standardizing processes and products with global norms is impeded by the absence of efficient institutional mechanisms.

Government agencies need to get their act together in terms of coordination, policy consistency and the quality of human resources, especially in extension and research. Cooperation across agencies is critical to addressing the natural resource aspects of capture and culture fisheries, which require rationalizing policies on land and water use. Fisheries development and growth are sustainable only with adequate support services. Training, extension, financial services, skilled human resources and market infrastructure lay the groundwork for increasing productivity and competitiveness. Establishing an adequate support system requires considerable investment, meticulous planning, and the integration of activities to assure quality and timeliness in service delivery over the entire supply chain.

WorldFish policy briefs present current issues on fisheries and aquaculture with a course for action outlined. These briefs serve as an impetus for action and update of WorldFish research.

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