



## Supply and demand issues affecting fisheries and aquaculture in the Philippines

### KEY MESSAGES

- Municipal fisheries have declined since 1991, as overfishing and habitat destruction depleted coastal fish stocks, and commercial fishing has stagnated in recent years
- Aquaculture has grown steadily and is expected to be the dominant contributor to meeting continuing growth in local demand for fish
- With continued growth in population, demand for fish is expected to continue to increase in aggregate, even as per capita consumption falls
- The deterioration of coastal fish stocks accompanied an increase by nearly half in the incidence of coastal poverty in the decade to 1997
- Fisheries products now rank second to coconut products in their share of agricultural export revenue

### FISHERIES OVERVIEW

Fisheries are vital to the Philippines, meeting much of the country's demand for animal protein, providing employment to many of its most vulnerable households, and contributing significant export earnings to national coffers. Today, the sector must balance the requirements of production growth for food security against the need to protect the long-term sustainability of fishery resources. It must also ensure that these resources are deployed to the benefit of the poor fishers who derive a substantial portion of their sustenance and income from small-scale fishery activities and enterprises.

Although fisheries contribute only modestly to the Philippine gross domestic product (2.1% in 2005), they have always been important to livelihoods, especially in coastal areas. In 2002, people working directly in fisheries amounted to slightly more than 1.6 million, representing about 12% share of those employed in agriculture. The municipal fisheries sector (mostly small-scale) accounted for more than one million (1.4 million) operators while the commercial fisheries and aquaculture sectors contributed 16,497 and 226,195 operators, respectively. In 2005, the gross value added by fisheries accounted for 22.5% of agricultural gross domestic product.



*A bountiful aquaculture harvest; in 2005 aquaculture accounted for 46% of total fish production in the Philippines*

Philippine fisheries divide into three sub-sectors: municipal fisheries, commercial fisheries and aquaculture. Municipal capture fisheries have declined since 1991, as overfishing depleted coastal fish stocks. After growing quickly in the 1980s and 1990s, commercial fishing has stagnated in recent years, despite the Philippines' vast exclusive economic zone of 2.2 million square kilometers. Aquaculture, on the other hand, has grown steadily and is expected to be the dominant contributor to meeting continuing growth in local demand for fish as the population rises. In 2005, aquaculture accounted for 46% of total production (more than doubling its share since 1980, when it was 18%), commercial fisheries for 27% and municipal fisheries for 27%.

**Aquaculture Ascendant.** The Philippines has vast potential in water resources, both inland and marine, and is blessed with a tropical climate conducive to aquaculture. As capture fisheries, especially municipal fisheries, stagnate and decline, aquaculture has largely filled the gap with

increased production of fish, crustaceans, mollusks and other aquatic products.

Aquaculture operates in three farming environments: freshwater aquaculture in lakes, rivers, reservoirs, tanks and rice paddies; brackish water aquaculture in coastal estuaries; and mariculture or sea farming, which is further subdivided into finfish, shellfish and seaweed. In 2005, mariculture posted by far the highest production level, reaching 1,419,727 tonnes (much of it seaweed), followed by brackish water production at 277,230 tonnes and freshwater production at 198,891 tonnes.

## FISH DEMAND AND SUPPLY

At the beginning of the new millennium, the WorldFish Center launched its AsiaFish model to allow nine participating Asian countries — which together account for more than a third of the global fish catch and over 84% of world aquaculture output — to make projections of supply and demand for

cultured and wild fish up to 2020. For the Philippines, the model projects sluggish growth for both output, which is projected to grow by an annual average of 0.71% by volume (4.99% by value), and consumption, which looks set to grow by 0.79% by volume (5.23% by value).

**Demand.** Fish and rice have been the staple diet of the Filipino people for centuries. In recent decades, however, annual per capita consumption of fish has fallen from 36 kilograms in 1976-78 to 33 kilograms in 1994-96 and further to 26 kilograms in 1997-2001. To some extent, this decline reflects a shift among wealthier Filipinos toward other kinds of meat, but it also betrays a nutritional squeeze on poor Filipinos.

Patterns of fish consumption vary among Filipinos according to income. In 2000, the value of average per capita fish consumption in the richest quintile was 3.4 times that consumed in the poorest quintile. Yet the poor depend much more heavily than do the rich on fish as their primary source of animal protein. While fish products accounted for 46% of household expenditure on meat products among all Filipinos, the figure for families in the poorest quintile exceeded 70%, while that for the richest quintile was 38%. Often, low-income consumers purchase cheaper fish types (including processed fish), while more affluent consumers purchase the bigger and more expensive fresh fish.

Total annual consumption of fish and fishery products in the Philippines averaged 2.0 million tons from 1997 to 2001, increasing at an average rate of 2.2% each year. With continued growth in population and per capita income, demand for fish is expected to continue to increase in aggregate, even as per capita consumption falls. While total fish consumption in urban areas is expected to expand at an average annual rate of 1.69%, consumption in rural areas is expected to contract at an average annual rate of 1.18%. As both rural and urban areas experience continued population growth (2.25% annually in urban areas), per capita fish consumption is expected to decline across the board—but especially severely in comparatively poor rural areas.

**Supply.** From 1997 to 2001, fish production in the Philippines averaged 2.2 million tons. Recent decades have witnessed

significant changes in fish sources. In 1965, commercial and municipal fisheries together accounted for 90% of total fisheries output, each accounting for half of that share. By 2002, the two capture fisheries together accounted for only 60%. While total fisheries production rose at an average annual rate of 4.5% between 1966 and 2001, aquaculture recorded average annual growth of 9%, or double the overall rate. Reviewing only more recent years, from 1997 to 2003, aquaculture grew on average by 8% annually, commercial fisheries by 4% and municipal fisheries by 2%. Municipal fisheries have been particularly troubled, as their output in 2001 was only about 85% of that in their peak years of 1983 and 1991. The problems besetting municipal fisheries, upon which the poorest fishers depend, are due mostly to overfishing and habitat destruction, the encroachment of larger fishing vessels and the resulting deterioration of fish stocks in coastal waters. This deterioration accompanied an increase by nearly half in the incidence of coastal poverty in the decade to 1997.

**Imports and Exports.** Tariff reform in the Philippines has seen tariff rates for fishery imports fall from the range of 10-50% in the 1980s to 3-15% in 2000, with further reductions to 5% or less anticipated in the first decade of the new millennium. Tariff reform for other agricultural commodities has turned the Philippines into a net food importer, in particular for cereals, livestock meat and dairy products. Fisheries is an agriculture sector that has fared better than most, now ranked second to coconut products in its share of agricultural export revenue, contributing about 19% to the whole. Between 1997 and 2001, the Philippines annually exported 0.3 million tons of fishery products, while importing 0.1 million tons of mostly cheaper fishery products from overseas.

The AsiaFish model projects Philippine fishery exports to continue to grow in quantitative terms for almost all fish types and especially for milkfish and shrimp. Exports are expected to grow more quickly when measured in value terms, as prices rise. Meanwhile, imports will likely decline in quantity, despite relatively cheap processed fish being the only imported type expected in increased quantities, while increasing by value because of generally rising prices.

## TECHNOLOGY PRIORITIES

The AsiaFish model provides a method of ranking aquaculture, capture fishery and postharvest technologies in terms of their potential to improve the welfare of poor households. For aquaculture and postharvest technologies, researchers weighted systems according to their production efficiency (weighted at 15%), contribution to food security and nutrition (20%), generation of employment (25%), environmental impact (25%) and social acceptability among the poor (15%). Capture fishery technologies were ranked with different weightings: production efficiency (18%), food security and nutrition (23%), generation of employment (18%), environmental impact (18%) and acceptability (23%). Simulations assumed that no significant technological progress or policy change would occur to 2020, and that exogenous variables would change at their historical rates.

**Aquaculture Priorities.** Among 41 aquaculture technologies ranked according to their priority score, ornamental fish hatcheries scored highest in the freshwater system. For brackish water systems, modular milkfish monoculture in earthen ponds scored highest, and *Caulerpa* pond culture scored highest in the mariculture environment. Intensive catfish monoculture in earthen ponds obtained the lowest priority.

Interventions to improve milkfish, tilapia and carp production are especially promising in terms of expanding supplies of

these popular fish species. Milkfish and tilapia in particular have high own-price elasticities, which means that changing the fish price greatly affects the size of the market for it. As both milkfish and tilapia are popular aquaculture species in the Philippines, their production can be boosted more easily than can that of captured species. As more of these fish are produced through aquaculture, their prices are expected to decline, benefiting the lower income groups that comprise the bulk of the country's population.

The modelers found that promoting shrimp technology generates the highest increases in revenues and net exports. Notwithstanding its unfavorable effects, among which is a decline in fish consumption among rural households, this intervention should not be abandoned altogether. It may best be accompanied by policies that aim to redistribute gains to the poor.

**Capture Fisheries Priorities.** Among the 23 capture fisheries technologies identified, multiple handline gear topped the priority list, followed by squid line fishing, set net, and tuna handline (both small scale and commercial).

**Postharvest Priorities.** The 12 postharvest technologies for the fishery sector range from dried, smoked or deboned fish to fish sauces and crackers. Shrimp crackers scored as the top priority, followed by dried fish and fish paste. Mussel chips and smoked deboned fish were the least acceptable technologies and occupied the bottom of the priority list.

WorldFish Issues Briefs present concise synopses of topical concerns in fisheries and aquaculture.

This Issues Brief was prepared from the following source material:

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The report describes a three-year project covering nine countries, Bangladesh, China, Indonesia, Malaysia, Philippines, Sri Lanka, Thailand and Vietnam, which was undertaken by the WorldFish Center and supported by the Asian Development Bank (ADB) and the Consultative Group on International Agricultural Research (CGIAR).

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