1.2 Promoting sustainability of culture fisheries in Asia and Australia

Background

Aquaculture has been the fastest-growing food production sector in the world for the last two decades, with an overall growth rate of 11% per year. In recent years, aquaculture production has made up for the declines in capture fisheries but many challenges face fisheries producers and resource managers. These include population pressures; competition for land, water and coastal wetlands; pollution; and habitat degradation. Nevertheless, aquaculture can generate income and alleviate poverty for poor inland and coastal communities.

Aquaculture lags behind the animal production industries in improving productivity through existing and developing technologies. Research can help to increase fish production by domesticating promising new species; improving breeds by genetic selection; developing cost-effective feeds from non-fish sources and refining new diagnostic tools to control disease threats. The integration of aquaculture with existing agriculture allows smallholders to better use scarce water resources, to recycle farm by-products and waste, and to improve the economic and environmental sustainability of their farming. Women too can benefit greatly when aquaculture is introduced into small-scale farming systems.

Water covers 70% of the earth and 97.5% of it is seawater. Thus, the sea is now a major focus for expanding aquaculture, and many new species are under investigation to supplement wild sources. New opportunities include sea ranching and marine cage culture. Mariculture also provides new tools to restore and supplement depleted wild stocks. Freshwater aquaculture has a long history particularly in Asia, where pond and cage culture predominate. Resource enhancement in closed and open water bodies is receiving increasing attention, and could help to increase production.

Australian aquaculture is small by world standards, but its production has more than doubled since 1984, and the industry now contributes 30% of the gross value of Australian fisheries production. This commonality of interest with the developing world provides opportunities for productive research collaboration. Aquaculture is gaining an increasing profile among the 22 member nations and territories of the Secretariat of the Pacific Community (SPC). The increasing involvement of Aboriginal and Torres Strait communities in aquaculture matches similar-scale activities in neighbouring countries, giving opportunities for joint initiatives.

Key strategies

Australian research skills in environmental management and allied animal and plant production sciences are increasingly being harnessed to solve the problems constraining aquaculture production. We will focus on high-gain areas where there is clear complementarity of interests and scientific skills between Australia and overseas partners. ACIAR's longer-term research goals include:

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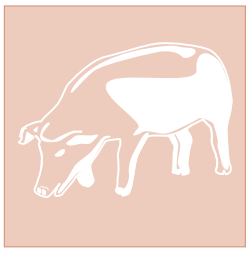

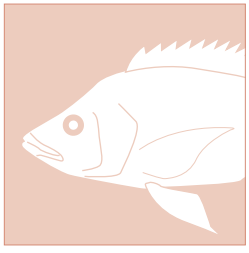

- developing and promoting new and existing technologies to increase efficiency in aquatic farming while reducing losses from disease and environmental impacts;
- developing more effective feeds incorporating less fish-based protein;
- domestication and genetic improvement of promising new species;
- fostering multidisciplinary approaches to managing environmental impacts;
- promoting the integration of aquaculture into existing farming systems; and
- investigating low-technology mariculture and sea-ranching options in coral reef environments.

Implementing the strategies

The key areas are:

- domestication and breed improvement of promising new species (domestication is essential for breed improvement yet relatively few culture species have been domesticated and genetic improvement programs are in their infancy);
- improved nutrition, the better use of on-farm feed sources, and the development of cost-effective feed formulations, and feed development, with emphasis on low-polluting formulations and reduced use of fish products, together with better feeding strategies;
- integration of aquaculture into existing small-scale farming systems;
- the diagnosis, control and management of aquatic diseases (severe, often catastrophic losses to disease are commonplace and poorly understood, and viral diseases in particular warrant special attention—ACIAR will continue work on shrimp disease in the interests of smallholder farmers);
- culture-based fisheries in inland water bodies (reservoirs are often a resource of last resort for the landless and under-employed fishers, allowing them small-scale aquaculture and enhanced fisheries);
- low-technology mariculture and sea ranching options in coral reef environments (the focus will remain on advances in village-scale mariculture technologies which promise reef resource enhancement and diversified sea farming, especially for Pacific Island nations);
- multidisciplinary approaches to the amelioration of environmental impacts of and on aquatic farming systems; and
- aquaculture in inland saline environments to assist with the management of saline, degraded ground water, and to diversify production in inland farming communities.

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