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Source: **The ICLARM-CLSU Integrated Animal-Fish Farming Project: Final Report (1982)**  
by Kevin D. Hopkins, ICLARM, MC P.O. Box 1501, Makati, Metro Manila, Philippines;  
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## **INLAND FRESHWATER VS. COASTAL BRACKISHWATER AQUACULTURE: BENEFITS FOR WHOM?**

While national governments and international agencies are beginning to pour money and technical resources into aquacultural development, the argument is made that its benefits are in danger of being skewed in much the same way that the benefits of development in agriculture and marine fisheries have been skewed in favor of the already affluent. However, aquacultural development is still in its infancy - lessons from past mistakes can be learned - and there is reason to hope that important actors in the field are concerned that the benefits of aquacultural development be equitably distributed.

For present purposes, development is defined as conscious actions which promote sustainable and equitable processes of change leading to improvement in the quality of life. The issue of sustainability is for obvious reasons important in regard to development of natural resources of resource dependent production systems such as aquaculture. Equity demands the socially defined just distribution of benefits.

Policymakers who are responsible for the promotion of aquacultural development make a series of choices regarding which type of aquacultural technology to promote. The choices they make often reflect a common technocratic worldview which equates development with increased productivity and economic efficiency. This view of development is consistent both with the class and institutional interests of national elites in Third World nations and the perspective of international assistance agencies involved in fisheries and aquacultural development. The need to generate foreign exchange earnings is a key factor in decisions to promote capital-intensive, export-oriented aquacultural development. The need to address malnutrition and rural poverty may be recognized as a serious problem, but these often appear to be regarded as secondary to the problem of increasing foreign exchange earnings.

To focus on inland freshwater vs. coastal brackishwater aquaculture, much more than the presence or absence of salt separates fresh and brackishwater aquaculture. Of central importance are differences in market orientation, property rights, and scale of operations.

Prior to the 1970s, coastal aquaculture was the province of small-scale producers of fish and shrimp for domestic markets. Over the past two decades, however, coastal aquaculture has been transformed into a major source of foreign exchange earnings due to technical advancements in the production and international marketing of penaeid shrimp. The expansion of shrimp mariculture into mangrove habitat generally involves the transformation of a multi-use/multi-user coastal resource into a privately owned single purpose resource. The expropriation of coastal resources has a direct effect on coastal residents' ability to earn a living. Not only do they lose access to mangrove products, they also are likely to suffer losses due to declining catches from fisheries resources associated with the mangrove.

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**Communities of people who depend on mangrove resources tend to be politically and economically marginal. It is not surprising that what they regard as their traditional resource use rights are ignored by modern society.**

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The question of property rights directly affects the issue of scale in operations. Most land suitable for inland freshwater aquaculture already is owned, in general by small-scale producers. In contrast, coastal mangroves are subject to distribution under state control, making it relatively easy to create large holdings. Shrimp maricultural development of the type most commonly promoted by national governments and supported by international development agencies is oriented to large-scale enterprises rather than to small-scale producers.

Market orientation has direct implications for scale of operations. Most freshwater species are not regarded as luxury food items, so that production remains available to rural consumers rather than being attracted into urban markets or exported to other countries. Freshwater aquaculture lends itself well to integration with other farm household activities. Selling small quantities of fish to local residents also may provide small but for the household important increases in income.

Opportunities for supernormal profits in shrimp mariculture have attracted well-financed entrepreneurs. Shrimp culture is capital rather than labor intensive. During the construction phase, significant amounts of unskilled labor are required, but once the ponds are in place, the labor demand is limited. The irony is that the very process of shrimp maricultural development directly contributes to low wages by restricting access to local resources, thereby reducing local employment opportunities and increasing workers' dependence on seasonal jobs which require few skills. The problem with shrimp culture is that it is being pursued with such single-minded devotion that social and environmental consequences are not adequately considered.

The negative consequences of shrimp maricultural development are not the blind chance of a cruel economic fate, but rather are the direct result of structural inequalities of wealth and power. These factors combine to create significant structural change, the marginalization of coastal residents as unskilled labor, and a seriously skewed distribution of development benefits. Profits and foreign exchange from shrimp mariculture often have been earned at the expense of broader social interest.

Development of the productive potential of aquaculture represents an important opportunity to help solve problems of protein malnutrition which occur in rural inland areas of many Third World nations. Production of such freshwater species as tilapia involves relatively simple technologies and little capital investment. Such production systems can be integrated into existing household activities and contribute to fuller utilization of available labor and material resources, including animal wastes and crop residues. Freshwater aquaculture can be promoted either as a private activity of individual households or as communal activities organized along cooperative lines.

If development is perceived as a process through which improvements are made to the quality of life for society as a whole, rather than for certain classes or groups, current policies by national and international agencies need to be reconsidered. In particular, greater emphasis needs to be placed on inland freshwater aquaculture, where the potential for improving nutrition and income for those most in need is great.

