


The role of aquaculture in the sustainable development of irrigated farming systems in Punjab, Pakistan

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Abstract

Natural resource managers in Pakistan today preside over a massive investment in water distribution infrastructure. An historical bias towards large-scale irrigation systems and a focus on water use for arable crop production appears to have contributed to an imbalance in food production in the region. This has resulted in the diminished supply and elevated price of fish and meat products, compounded by the disruption of natural fisheries. The situation is inconsistent with the regions food security needs and an important potential role exists for increased aquaculture development.

Physically and organizationally, the integration of various fish production approaches into existing land and water use practices would also appear to be fundamentally feasible. There would appear to be strong economic justification for diversified water use involving fish production, especially small and medium-scale carp production in ponds, using ground water. More broadly, within the context of the limited potential for further expansion of water resources, integrated aquaculture could contribute a vital productive element to various components of the water distribution arid irrigated farming systems in the Punjab. These include: supply canals, provided diverse institutional and engineering objectives can be accommodated; groundwater (including potential application of saline groundwater); the farm sub-system, especially integrated rice and fish production options in conjunction with alternative pest control strategies such as Integrated Pest Management; and irrigation drainage systems, where water quality permits.

Therefore urgent broad research objectives should include the definition, investigation and development of a series of distinct economic and environmentally sustainable approaches to integrated animal protein production from aquatic resources, presently managed principally for agricultural production. Approaches should involve both the replacement of lost fishery potential resulting from large-scale irrigation development and flood control management, and the development of net gains in aquatic output, and should focus particularly on efforts to promote recycling of agricultural residues, reduced pesticide use and efforts to make better use of scarce water resources through the integrated aquaculture production across a broad range of water resources.

An increasing number of countries are approaching full development of their surface water resources, and like Pakistan many face the development of new management approaches to increase diversity and improve productivity in relation to water use. The lack of research in support of the development of integrated aquaculture, which lags many years behind comparable agricultural research, may be constraining the breadth of choice available to natural resource managers to meet their food security needs.

References



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