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## RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

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**Title:** Semi-Intensive Pond Aquaculture

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**Abstract:** Semi-intensive production of tilapia in ponds using fertilizers and supplementary feeds is a means to produce low-cost fish which contributes to national food security in many developing countries. Culture of herbivorous and omnivorous tilapias feeding low down on the food chain provides produce that is potentially available to a wide range of consumers as a staple food. This feature led to tilapia being referred to as an 'aquatic chicken' (Maclean, 1984). Indeed, global production and value of farmed tilapias increased at a recorded average rate of 11.4 and 15.5% between 1986 and 1995, respectively (FAO, 1997). The rate of increase has probably been higher because of considerable underestimation of farmed tilapia production, particularly in Asia which dominates production, because of the difficulty of collecting statistics from diverse and widely scattered farms in developing countries. Using hatchery data as a proxy for output may be useful for carps and other species produced in conventional hatcheries but as tilapia can breed in food fish production systems this method cannot be used (Little and Hulata, this volume). Tilapias are currently farmed commercially or experimentally in at least 75 countries (Pullin et al., 1994). Over the past decade a low-tech/high-tech 'divide' has developed in tilapia culture similar to that which occurred with poultry (Pullin et al., 1994). At the same time that small-scale farmers in developing countries in Asia are introducing tilapias into traditional carp polycultures, entrepreneurs are exploring ways to farm tilapia as an international commodity, usually by using relatively high-cost intensive culture using complete feeds. This is to satisfy a rising demand for high quality 'white fish' products in the developed world, especially in Europe and North America. However, the major factor inhibiting the purchase of more tilapia in North America is price; tilapia is overpriced compared to chicken and most other forms of animal protein using current, largely intensive methods of aquaculture (Smiley, 1995). The case is made in this chapter that a semi-intensive mode of pond culture can be used effectively to satisfy

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both the subsistence needs and growing desire of small-scale farmers to intensify production to generate income and to lower the cost of production of industrial scale farming. The current status of production and regional evolution of culture of tilapias is compared with carps, the major group of inland herbivorous/omnivorous finfish. Culture systems of tilapias in three major resource zones (inland, rural areas; wastewater-fed culture in periurban areas; and in coastal areas) are discussed. The scientific basis of pond fertilization and supplementary feeding strategies are reviewed, followed by consideration of environmental and long term sustainability of semi-intensive pond culture of tilapias.

This abstract is excerpted from the original paper, which was in: M.C.M. Beveridge and B.J. McAndrew (Editors), *Tilapias: Biology and Exploitation*. Kluwer Academic Publishers, Netherlands, pp. 377–403. (2000)