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Sustainable Aquaculture for a Secure future

Title: Climate, Site, and Pond Design

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Abstract: The utilization of ponds for growing fish is not a novel concept, and in fact, it antedates recorded history. Early records indicate that the Chinese produced food fish in ponds some 2500 years ago, although the' exact beginning of this practice is not known (Edminster, 1947; Landau, 1992).The Romans utilized fish ponds in the first century A.D., not only to raise food fish but also to raise fish for stocking in natural lakes and other ponds (Edminster, 1947). Bas-relief sculpture found in Egyptian tombs apparently depict pond culture ofti1apia around 2500 B.C. (Landau, 1992).

Originally the concept of a fish pond was quite different than it is today. Early fish culturists simply attempted to make the pond resemble the natural waters in which the fish were found. Early fish culturists recognized the importance of maintaining cultural environments similar to each aquatic animal's natural environment. As a result, aquatic organisms were not cultured in the densities they are today, but in some instances prepared feeds were provided (Landau, 1992).

Early pond construction methods were essentially the same as those utilized today with respect to the use of clay, proper sloping of sides, appropriate levee width, freeboard, and methods to dispose of flood waters (Edminster, 1947). These features were recorded in the early 1700s, but the importance of a controlled water supply was not mentioned until the 1800s by Boccius (Edminster, 1947). Boccius even cautioned against utilizing trees on levees.

The prominent pond design in the early days of aquaculture is equivalent to the modem race-way. Ponds were tiered, with each pond draining into the pond below it. A slightly different

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method of production was utilized in the Rhine Valley in France, where farmers combined aquaculture and agriculture. After raising crops for a couple of years, farmers flooded their fields with shallow water and stocked them with fish. Once the fish were harvested, the field was drained and utilized once again for crop production (Figure 1) (Edminster, 1947).

The methods of pond construction are based on techniques that are hundreds to thousands of years old; only the refinements are new. In this chapter the relevance of climatic factors and geographical features with respect to site selection and pond design are discussed. Once the pond is designed and built, then the principles of water budgets and pond management are important and are described as they relate to the various pond types. Climatic factors, geographical features, water budgets, and pond management are important basic elements that need to be understood in order to successfully produce an aquaculture crop.

This abstract is excerpted from the original paper, which was in: H.S. Egna and C.E. Boyd (Editors), *Dynamics of Pond Aquaculture*. CRC Press, Boca Raton, pp. 109–134. (1997)

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