MILKFISH POND ENGINEERING

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Today's modern engineering technology began in a trial and error fashion. It took years before the numerous engineering designs and formulas and a rational approach to the design and construction of establishments were developed. It also took continuous refinements and painstaking effort before the developed status in engineering science and technology in various disciplines was achieved.

Milkfish pond engineering is a young and specialized field. It would require putting together appropriate principles and techniques from various engineering disciplines in order to establish functional fishpond facilities. For years, fish culture did not benefit from the advancement and development in engineering technology; in the past both fish culturist and engineer ignored each other in working towards the progress of the industry. Very few engineers had ventured in this kind of occupation.

As a result, instead of putting together and modifying engineering technology that were already available, early pond developers resorted to the costly trial and error method of designing and constructing the facilities.

At the very beginning, many of the pond owners were not fully aware of the relationship between the engineering design considerations in ponds and the biological requirement of milkfish as a cultured animal. Gradually, however, a few innovative pond owners began to recognize the benefits derived from properly engineered ponds.

The experience in the development of milkfish ponds is long enough to provide information and draw workable recommendations on pond engineering.

Milkfish Pond Engineering Technology

At present, information on the following are already recognized which can be organized and referred to as the pond engineering technology for milkfish: 1) Criteria on site selection for fishponds; 2) Relationship between the size of gate, pond water level and design tide curve; 3) Design elevation of foundation; 4) Relationship among the sizes of pond compartments according to their functions; 5) Different types of layout schemes; 6) Size and proportioning of dikes; 7) Control of internal erosion and seepage; 8) Methodology on pond construction and repair, including related facilities; and 9) Construction tools and machineries.

The papers of Denila (1, 2), the FAO report of Jamandre (3) and the book of delos Santos (5) were the products of their experiences in milkfish pond engineering. The information they have presented can be considered vital contribution to the milkfish pond industry. They have discussed extensively the various factors to consider in the site selection, size and layout of pond compartments, canal system and their specifications, construction methods for dikes, including the necessary implements and machineries, and the technique in the construction of pond water control structures.

The techniques in determining the size of fishpond gate in relation to the design depth or level of water in the pond and design tide curve as presented by the three authors was further elaborated and strengthened by Katoh (4). Katoh showed how the size of gate opening can be analytically determined through iterative process. The method of determining the design elevation of gates and ponds was also discussed. Although the idea is not new to our fishpond operators, it was observed that only a few of our ponds were constructed in accordance to the required elevation.

Like any engineeering project, economy of construction, aesthetics, environmental impact, and functionality are the four major considerations in the layout and design of ponds. Functionality connects the engineering know-how in satisfying the environmental or biological requirement of milkfish in various stages of growth. This includes location, size and shape of each compartment, water supply and drainage system, and the projected fish culture management scheme. There are three layout schemes now existing -- the conventional, progressive and radiating. While the scheme looks all right, the report on comparative production of each scheme under a given set of conditions is missing.

The problem of controlling internal erosion in fishponds was one of the areas covered during the regional workshop on aquaculture engineering sponsored by SEAFDEC and the South China Sea Fisheries Programme. A number of ways including the materials considered useful for controlling erosion were reported.

On seepage problem, proper construction of dikes is the key to minimizing it. Denila (1, 2) has illustrated how to construct the dikes properly. Should the problem of seepage exists, however, there are also remedial ways and information that may be tapped.

Conclusion

The subjects briefly discussed are the main concern of milkfish pond engineering. In other related areas where engineering is needed, I am almost certain that information from other engineering disciplines are already available. We only need to harness and modify these information if necessary to fit our purpose.

There is a need to compile and synthesize the information on hand about milkfish pond engineering into one package of technology.

References

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