# Reporting Fishpond Yields to Farmers

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The frustrations encountered when trying to compare technical reports in which fishpond yield figures are reported in a variety of units (e.g., kg/ha, kg/pond, lb/acre, etc.) are familiar to most aquaculturists. These frustrations become worse when, after digging through a desk drawer for a calculator to convert the yields to a standard unit of measure, the calculator's batteries are invariably dead. Because of this, strong efforts have been made to encourage researchers to use only kg/ha when reporting results. I agree with this standardization if other researchers are the audience. However, severe problems may develop when trying to communicate research results to other audiences if data are transformed to a hectare basis.

Through the marvelous power of hindsight, I will describe a lost opportunity for making a significant impact on the adoption rate of integrated aquaculture-agriculture farming technology. In the late 1970s and early 1980s, the ICLARM/Central Luzon State University Integrated Animal-Fish Farming Project at Muñoz, Nueva Ecija, Philippines, quantified several relationships between manure input and fish yields (Hopkins et al., 1981 and Hopkins and Cruz, 1982). We reported the yields using kg/ha and manure input using tonnes/ha. We also conducted a preliminary economic analysis which indicated that under conditions of limited supplies of manure as normally encountered on small farms, 67 pigs/ha would maximize profit for ponds with a pumped water system while 53 pigs/ha would maximize profit for ponds with gravity-fed water systems.

Extension agents and farmers started asking for recommendations for integrating pig rearing with fish farming. Our standard answer was 67 pigs/ha or 53 pigs/ha. The next question was usually "How much will we harvest?" Our answers were 2,638 kg of tilapia/ha in 6 months using 67 pigs/ha and 2,319 kg of tilapia/ha in 6 months using 53 pigs/ha. The farmers and extension workers then left after being appropriately impressed with our high production rates.

We thought that our demonstration of the potential of integrated livestock-fish farming would lead to ready adoption of the technology. It usually did not. And when it did, the recommended manure loading rates were not used. The farmers tended to put whatever manure they had into whatever size ponds they owned or could easily build.

What went wrong? Possibly, the units we used (i.e., pigs/ha and kg/ha) were to blame. Most of the interested farmers had only small land holdings and a few pigs. They could not relate to 53 pigs or to a 1-ha pond. Our assumption that they would algebraically convert kg/ha and pigs/ha to their available ponds and numbers of pigs was plainly foolish. A more appropriate method of presenting our findings to extension workers and farmers would have been a table such as Table 1.[a] This table presents expected fish yields using various combinations of pigs and pond sizes.

The table does not make any assumptions regarding economic viability. However, this lack of economic information may actually be beneficial for two reasons. First, responsibility for decisions regarding profitability remains with the farmer. Second, economic analyses of small-scale farms are often inaccurate because of the difficulties in assigning costs for land and labor. The farmer is in a better position than the researcher to determine if the expected yield is worth the farmer's inputs.

To those extension specialists who have just read this article and are asking why didn't I think of this before now, I can only reply that my primary interest was the data, not communication with the farmers. I can only urge aquaculture scientists to consider carefully their intended audience when deciding what units to use when reporting their data. Blind conformance to standard units can blind the audience.

Table 1. Estimated total tilapia yield (kg) from two 3-month duration fish culture cycles during one 6-month pig rearing cycle.

| Pond size ($m^2$) | Number of pigs | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| 100 | 29 | 17 | 11 | 0 | 0 |
| 200 | 45 | 59 | 42 | 34 | 30 |
| 300 | 50 | 79 | 88 | 77 | 50 |
| 400 | 54 | 90 | 111 | 117 | 108 |
| 500 | 55 | 96 | 125 | 141 | 146 |
| 600 | 57 | 100 | 134 | 158 | 172 |
| 700 | 58 | 104 | 141 | 170 | 190 |
| 800 | 59 | 106 | 146 | 179 | 204 |
| 900 | 60 | 109 | 151 | 186 | 215 |
| 1,000 | 61 | 110 | 154 | 192 | 224 |

Example: A farmer with 3 pigs and 900 $m^2$ of land available for a pond could expect to produce 151 kg of tilapia every 6 months. If that farmer decided to reduce the pond size to only 500 $m^2$ because he wanted to use the remainder of the land for another agricultural crop, the expected tilapia yield would decrease to 125 kg every 6 months.

[a]This table was developed from Fig. 3 in Hopkins et al. (1981) for ponds stocked at 17,000 tilapia fingerlings/ha.

## References

Hopkins, K.D., E.M. Cruz, M.L. Hopkins and K.C. Chong. 1981. Optimum manure loading rates in tropical freshwater fishpond receiving untreated piggery wastes, p. 447-460. *In* Chung Po (ed.) Animal waste treatment and utilization. Council for Agricultural Planning and Development, Taipei, Taiwan.

Hopkins, K.D. and E.M. Cruz. 1982. The ICLARM-CLSU integrated animal-fish farming project: final report. ICLARM Technical Reports 5. International Center for Living Aquatic Resources Management, Manila, Philippines, 96 p.