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Sustainable Aquaculture for a Secure Future

Title: What Influences the Success of Aquacultural Research Projects?

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Abstract: No research program can enjoy long-run success without a periodic assessment of how it is performing and what factors influence success and failure. While most such assessments are informal and specific to a particular study, formal evaluations eventually become important at the program level. A formal analysis the same as an informal one in the sense of comparing research outputs with the inputs or efforts expended to achieve them (a “knowledge production function”). Approaches to research assessment thus differ only in how such outputs and inputs are to be understood, measured, and compared.

Assessment methods can be either quantitative – typically statistical – or the kinds of institutional evaluation one sees in a case study. In biological disciplines, at least, most statistical analyses of the factors affecting research success employ the scientists’ publication counts, citations, or intellectual property as measures of research output. Methods are parametric or non-parametric, dynamic or static. In the parametric approach, the bibliographic output measures are regressed against current and lagged research expenditures, against other inputs or conditions poorly represented by expenditures, and sometimes against a time trend.

Adams and Griliches (1996), for example, examine U.S. university research performance in eight scientific fields during the 1980s. They find at the level of a particular university or field that diminishing returns to scale prevail in academic research. That is, increases in study size bring less-than-proportionate increases in the study’s publication output. At the aggregate

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level, however, there appears to be approximate equality between research expenditure and publication (or citation) performance, possibly because aggregate data incorporate cross-study knowledge spillovers that are not captured in more disaggregated data. These methods have more recently been applied to life-science research by Smith (1998), Xia and Buccola (2005), Groot and Garcia-Valderrama (2006), Buccola, Ervin, and Yang (2009).

The bibliometric approach is, despite its widespread use, inadequate in a number of respects. The first and probably most important difficulty is that publication, patent, and journal citation rates mask much of the detail of a study's findings and thus only grossly reflect the findings' nature, magnitude, and importance. Much published output also becomes available only years after the study has been completed. Finally, the bibliometric approach is poorly suited to an exact matching of a study's outputs and inputs.

To help solve these difficulties, we examine here a new approach to research assessment. The new method focuses directly on the information a research study has generated, enabling a more exact and more contemporaneous matching of that information to the skills, expenditures, and capital devoted to the study. We apply the approach to the 116688 55 past and on-going aquacultural research investigations which AquaFish CRSP is pursuing in eleven countries.

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