Estimation of Fish Biomass in Laguna de Bay Based on Primary Productivity[1]

INTRODUCTION

Phytoplankter have long been used as indicators of water quality and index of the productivity of any given water resource. Their small size and short life cycle enable them to respond quickly to environmental changes, hence, their standing crop and species composition are more likely to indicate the quality of the water mass in which they are found. They influence certain non-biological aspects of water quality (such as: pH, color, taste and odor), hence they are part of water quality.

Phytoplankton productivity is the common and important factor being considered in determining the overall status of a given body of water. This is because they are found at the base of an energy chain or food chain, being the basic source of primary food in a given aquatic system. Hence, information on their contribution is essential in indicating how much biomass energy will be available to all other living resources in the system.

Therefore, this study aims to relate primary production to fishery production in Laguna Lake with the following specific objectives:

1. To prepare a substantial review of related literature on the primary production of the lake;
2. To provide estimates of primary productivity of Laguna Lake over time;
3. to provide estimates on the potential fish yield from the open water of Laguna Lake over time; and,
4. To provide estimates of fish biomass from open water of Laguna Lake over time.

REVIEW OF LITERATURE

Brief Description of the Laguna Lake

Laguna Lake (popularly known as Laguna de Bay), the largest lake in the Philippines, lies about 15 km. southeast of Manila on the island of Luzon (Fig. 1). It has a surface area of 911 square kilometers or about 90,000 hectares, a shoreline of 220 km., a total volume of 3.2 x 109 m^3 an average depth of 3 m. The lake is generally turbid, most of the year mainly due to its high content of resuspended sediments. In 1994, the annual mean values of lake turbidity ranged from 58 to 84 mg/l SiO_2 (LLDA Master Plan, 1995). The shallowness of the lake (no more than 1 meter in secchi disk reading) contributes to its turbidity, too.

Of the 21 rivers which drain into the lake, the Marikina and Pagsanjan rivers contribute about 80% of its water volume (delos Reyes, 1995).

Topography. Laguna Lake was formerly a part of Manila Bay and was separated from it during quarternary times by movement along the Marikina fault (LLDA Report, 1978). Vertical displacement along the fault is estimated to be 150 meters in the Pasig area. The fault scarp, comprised of tuff (locally called adobe), constitutes the north/south trending ridge separating the lowland of Laguna Lake and Manila.

Several minor faults transect the lake area generally along the northeast/southwest

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