

PLANKTON BIODIVERSITY AND WATER QUALITY ASSESSMENT  
OF CAÑAS RIVER WATERSHED, CAVITE, PHILIPPINES

THESIS

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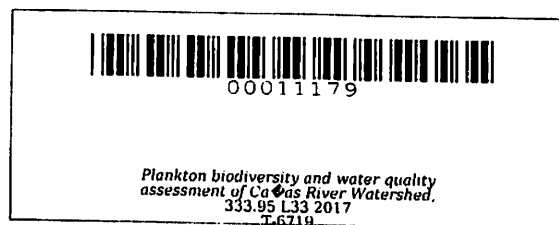
May 2017



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**PLANKTON BIODIVERSITY AND WATER QUALITY ASSESSMENT OF  
CAÑAS RIVER WATERSHED, CAVITE, PHILIPPINES**

**Undergraduate Thesis  
Submitted to the Faculty of the  
College of Agriculture, Food, Environment, and Natural Resources  
Cavite State University  
Indang, Cavite**

**In partial fulfillment  
of the requirements for the degree  
Bachelor of Science in Environmental Science**



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May 2017**

## **ABSTRACT**

**LAVADOR, NIELLA A. and MOTOL MARIA JUDITH P. Plankton Biodiversity and Water Quality Assessment of Cañas River Watershed, Cavite, Philippines.** Undergraduate Thesis. Bachelor of Science in Environmental Science. Cavite State University, Indang, Cavite. May 2017. Adviser: Ms. Amyel Dale L. Cero.

The study was conducted from June 2016 to January 2017 in Cañas River Watershed. The general objective of the study was to assess the plankton biodiversity and water quality of Cañas River Watershed. Specifically, it aimed to: (1) identify the phytoplankton and zooplankton species that are present in the rivers of the Cañas River Watershed; (2) assess the biodiversity of plankton species present in the rivers of the watershed; (3) determine which plankton species that are present in the rivers are bioindicators of water quality; (4) determine the physico-chemical characteristics of the rivers in terms of temperature, pH, dissolved oxygen (DO), salinity, conductivity, total dissolved solids (TDS); (5) determine the domestic uses of Cañas River Watershed; and (6) identify the problems and issues affecting the water quality of the rivers within the watershed.

Cañas River Watershed has a total land area of 11,083.28 ha and a length of 38.9 km. Six observation stations were established in the study area where water sampling for plankton identification and biodiversity assessment was done using plankton net, proper field and laboratory procedures and computation for biodiversity indices. Physico-chemical characterization of the river water was done using the portable instruments and multiparameter meter present in the CvSU-Department of Forestry and Environmental Science.

A total of 349 respondents from the different barangays that are traversed by the Cañas River was surveyed about water use and the problems/issues related to the river.

The study identified 46 species of plankton that vary through the season. There were 33 species of phytoplankton and 13 species of zooplankton. Results revealed that the most abundant species of phytoplankton during both dry and wet season is *Meliorisa* sp. followed by *Fragilaria* sp., while the most abundant species of zooplankton during both seasons is *Bdelloid*.

Among the 33 species of phytoplankton that were present in Cañas River there were only eight (8) identified genera that can be used as bioindicator of water quality. On the other hand, among the 13 species of zooplankton that were identified, only one (1) genus is classified as a bioindicator.

The average physico-chemical properties of Cañas River System during the wet season were as follows: temperature = 26.8°C, pH = 6.6, dissolved oxygen = 3.8 mg/L, salinity = 448 ppm, conductivity = 896.6  $\mu$ S/cm, and TDS = 600.4 ppm.

On the other hand, the average physico-chemical properties of the rivers during the dry season were as follows: temperature = 25.2°C, pH = 7.4, DO = 8.3 mg/L, salinity = 441.4 ppm, conductivity = 884.3  $\mu$ S/cm, and TDS = 592.6 ppm.

The communities, which are traversed by the rivers of the watershed, had different uses of the water from the rivers. Majority of the respondents answered fishing and recreation as their primary benefits from the rivers, followed by washing of clothes. Most of the problems and issues determined from the respondents were about improper disposal of waste to the river followed by improper wastewater disposal from the households. The other problems identified were lack of proper drainage system and

dumping of waste, especially in the downstream areas where all waste and sediments accumulate. There were no conservation and protection measures observed in the barangays that were involved in this study, according to the barangay officials and participants of the survey.

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An undergraduate thesis manuscript submitted to the faculty of the Department of Forestry and Environmental Science, College of Agriculture, Food, Environment and Natural Resources, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Environmental Science with Contribution No. ES-2017-02. Prepared under the supervision of Ms. Amyel Dale L. Cero .

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## **INTRODUCTION**

Watershed is an area of land that drains in all of the stream and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay or in any point along the stream channel. Sometimes, the word watershed is used interchangeably with drainage basin or catchment. Drainage basin is composed of ridges and hills that separate two watersheds according to the United States Geological Survey (2015). Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (1999) also defined watershed as a distinct geographical unit that can offer economic benefits like water, timber, non-timber products and intangible goods such as recreation, aesthetic, historical, cultural activities and environmental services.

Cavite has six major watersheds namely: Bacoor River Watershed, Imus River Watershed, San Juan River Watershed, Labac River Watershed, Cañas River Watershed, and Maragondon River Watershed. Cañas River Watershed provides water to Bayan