Water Quality Assessment and Environmental Valuation
of the UP Diliman Waterways

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ABSTRACT

UP Diliman's waterways, including the iconic UP Lagoon and the National Science Complex Creek, are vital to the campus's ecological health and urban sustainability. However, these waterways are increasingly threatened by pollution and anthropogenic activities. This study aims to provide a comprehensive analysis of water quality dynamics and the economic value of conservation through a combination of water quality assessments and environmental valuation.

Water quality was monitored at six sites across the UP Lagoon and CS Creek from 2021 to 2023, focusing on parameters such as pH, dissolved oxygen (DO), temperature, electrical conductivity (EC), total dissolved solids (TDS), salinity, ammonia, nitrate, phosphate, and total alkalinity. Principal Component Analysis (PCA) identified dominant factors influencing water quality, while WQI provided an overall assessment. The WTP survey, conducted with 150 respondents, estimated the public's financial support for conservation. Logistic regression was used to determine the key factors influencing WTP.

Results revealed significant seasonal variations in water quality, with ammonia, phosphate, and nitrate exceeding DENR standards in both seasons. The post-pandemic phase saw increased pollution in CS Creek and UP Lagoon, particularly in DO levels. PCA highlighted that water quality is influenced by ionic strength and biological processes, with distinct water quality profiles across sampling sites. The WQI for both waterways were classified as "Bad," emphasizing the urgent need for intervention.

The WTP survey showed strong support for conservation, with an aggregate dependable WTP of PHP 3,223,629 per month, reflecting substantial financial backing for long-term management. These findings highlight the need for targeted water quality management, enhanced stormwater systems, and sustainable funding mechanisms to ensure the ecological and economic sustainability of UP Diliman's waterways.

Keywords: Water Quality, Environmental Valuation, Willingness-to-Pay (WTP), Water Quality Index (WQI), Urban Waterways, Principal Component Analysis (PCA), Contingent Valuation Method (CVM), Sustainability