

Study Project In Environmental Engineering Title	Evaluation of wastewater treatment system management of Bangkok
Credits	6
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Abstract

Bangkok, the capital of Thailand, has been rapidly expanding in many aspects. In the future, there will be the integration of the ASEAN countries to form the ASEAN economic community (AEC) which will lead to an increase in population in Bangkok and sequentially will create more environmental problems especially wastewater problem. At present, Bangkok has solved the wastewater problems by constructing 7 water quality control plants including Rattanakosin, Si Phraya, Chong Non Si, Nongkheam, Thungkhru, Chatuchak, and Dindeang. However, there are still many areas in Bangkok that have not treated wastewater with corrected and standardized wastewater treatment system. This study emphasized on the efficiency of all 7 existing water quality control plants of Bangkok as well as their current problems. This study employed engineering and environmental economic tools for decision making. The environmental engineering analysis used the data of treatment efficiency, operating cost, and construction cost. For the environmental economic analysis, involved data were wastewater treatment expenses. All data used in this study were obtained from 7 water quality control plants of Bangkok. According to the existing data, these 7 water quality control plants were designed to receive a total flow rate of 992,000 m³/day. In 2013, the average influent flow rate was 679,100 m³/day. The results showed that the existence of water quality control plants could significantly improve the quality of rivers and canals. The operation costs were 3.12 to 4.13 baht/m³ for Bangkok self-operation case and 1.21 to 2.35 baht/m³ for private-hired operation case. Average BOD and SS removals were 83.56 percent and 81.21 percent, respectively. The efficiency of each plant was not significantly different and all plants could treat to comply with the current standards. In order to maintain the quality of all natural waters in Bangkok to reach the set standards, it is necessary to have wastewater treatment plants cover all Bangkok areas. Each wastewater treatment system has different advantages. Considering on the system capacity of 120,000 m³/d, the SBR system will require the highest space followed by AS-BNR system and Step-feed system which require 80% and 67% of the area required by SBR system. Operating costs of the SBR, AS-BNR, and Step-feed systems will be 0.37, 0.39, and 0.43 baht/m³, respectively. In addition, the maintenance costs throughout the service period (30 years) will be 235,637,838, 174,351,890, and 161,351,890 baht, respectively.

Keywords: Wastewater Treatment / Water Quality Control Plant / Environmental Engineering