

INTEGRATED ASSESMENT OF THE
KLANG RIVER WATER QUALITY FOR
ENVIROMENTAL MANAGEMENT

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ABSTRACT

The Klang River is an essential river for Klang Valley residents since there are two major dams at upstream of the river known as Batu Dam and Klang Gates Dam. This dam function as main water supply to the people of Klang Valley. Hence, it is essential to monitor the water quality by test the water regularly in order to maintain safe and reliable sources of water for the residents. The research is mainly about to determine the water quality of the Klang River via physical, chemical and biological test based on National Water Quality Standards (NWQS) and Water Quality Standards (WQI). Besides, it also focus on to identify the sources of contamination, recommend precautions and actions to take to consider the level of water quality. The 10 parameters that need to be determined are in-situ parameter such as pH, dissolved oxygen (DO), electrical conductivity, turbidity, temperature and ex-situ parameter such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solid (TSS), ammoniacal-nitrogen(NH₃-N) and presence of selected heavy metal. The Klang river water samples was taken from three point based on land use pattern. The sample were taken twice where sunny days during first sampling and rainy days during second sampling. The testing was done at UMP Environmental Lab of Faculty of Civil Engineering and Earth Resources. The presence of heavy metal were traced by using Atomic Absorption Spectroscopy (AAS) while presence of Ammonia Nitrogen was carried out based on the Standard Method APHA 4500-NH₃-BC. The test of TSS was carried out based on Standard Method APHA 2540-D and COD was carried out based on Standard Method APHA 5220-C. The presence of ammonia nitrogen was higher where it was between 7 – 13 mg/L during first sampling and 9 – 17 mg/L during second sampling. It supposed in range of 0.3 – 0.9 mg/L in order to classified it in class III. Besides, TSS showed higher reading where the range was in between 200 – 300 mg/L. It supposed to be in the range of 50 – 150 mg/L for Class III river. However, the other parameter are such as BOD,DO,COD, and pH showed in range of class III according to NWQS. The research found that Klang River water quality is currently in class III based on NWQS. It needs extensive treatment in order to use as water supply. The recommendation action to taken are installing additional gross pollutant traps, install more wastewater more treatment plant especially at more pollution area besides promote and manage river cleanliness.

ABSTRAK

Sungai Klang merupakan sungai penting untuk penduduk Lembah Klang kerana terdapat dua empangan utama di hulu sungai yang dikenali sebagai Empangan Batu dan Empangan Klang Gates. Fungsi empangan bekalan air utama kepada penduduk Lembah Klang. Oleh itu, adalah penting untuk memantau kualiti air dengan ujian air dengan kerap untuk mengekalkan sumber selamat dan boleh dipercayai air untuk penduduk. Kajian ini adalah terutamanya kira-kira untuk menentukan kualiti air Sungai Klang melalui fizikal, kimia dan ujian biologi berdasarkan Piawaian Kualiti Air Kebangsaan (NWQS) dan Piawaian Kualiti Air (WQI). Selain itu, ia juga memberi tumpuan kepada untuk mengenal pasti punca pencemaran, mengesyorkan langkah berjaga-jaga dan tindakan yang perlu diambil untuk mempertimbangkan tahap kualiti air. 10 parameter yang perlu ditentukan adalah in-situ parameter seperti pH, oksigen terlarut (DO), kekonduksian elektrik, kekeruhan, suhu dan parameter ex-situ seperti permintaan oksigen biokimia (BOD), keperluan oksigen kimia (COD), jumlah pepejal terampai (TSS), ammonia-nitrogen (NH₃-N) dan kehadiran logam berat yang dipilih. Klang sungai sampel air diambil dari tiga mata berdasarkan corak penggunaan tanah. sampel telah diambil dua kali di mana hari yang cerah semasa persampelan pertama dan hari hujan semasa persampelan kedua. Ujian ini dijalankan di UMP Environmental Lab Fakulti Kejuruteraan Awam dan Sumber Bumi. Kehadiran logam berat telah dikesan dengan menggunakan Atomic Absorption Spektroskopi (AAS) manakala kehadiran Ammonia Nitrogen telah dijalankan berdasarkan Kaedah Standard APHA 4500-NH₃-BC. Ujian TSS telah dijalankan berdasarkan Standard Menghubungi APHA 2540-D dan COD telah dijalankan berdasarkan Standard Menghubungi APHA 5220-C. Kehadiran ammonia nitrogen adalah lebih tinggi di mana ia adalah di antara 7 - 13 mg / L semasa persampelan pertama dan 9-17 mg / L semasa persampelan kedua. Ia sepatutnya dalam julat 0,3-0,9 mg / L untuk diklasifikasikan dalam kelas III. Selain itu, TSS menunjukkan bacaan yang lebih tinggi di mana julat adalah di antara 200 - 300 mg / L. Ia sepatutnya dalam lingkungan 50 - 150 mg / L untuk Kelas III sungai. Walau bagaimanapun, parameter yang lain adalah seperti BOD, DO, COD dan pH menunjukkan dalam pelbagai kelas III mengikut NWQS. Kajian ini mendapati bahawa kualiti air Sungai Klang kini dalam kelas III berdasarkan NWQS. Ia memerlukan rawatan yang luas dalam rangka untuk digunakan sebagai bekalan air. Syor tindakan untuk diambil memasang tambahan perangkap pencemar kasar, memasang lebih banyak air sisa lebih loji rawatan terutama di kawasan yang lebih pencemaran di samping mempromosi dan menguruskan kebersihan sungai.