Abstract

The study of water quality and water quality index (WQI) of drainage water from paddy fields was carried out in Bangban irrigation project, Phra Nakhon Si Ayutthaya province in February 2009. The study was divided into 2 parts. The first part was the physical and chemical analysis of water quality of collected water samples from 2 stations of irrigation canals and 44 stations of drainage canals. The second part was the establishment of WQI of drainage water from paddy field by employing questionnaires and the equation of water quality index. It was found that 11 suitable parameters to determine WQI of drainage water from paddy fields are herbicide (paraquat), biochemical oxygen demand (BOD), nitrate-nitrogen (NO_3^--N), pesticide (organophosphate), pesticide (carbamate), phosphate-phosphorus (PO_4^{3-}-P), ammonia-nitrogen (NH_3-N), pH, total dissolved solids (TDS), suspended solids (SS), and electrical conductivity (EC). The WQI of drainage water from paddy field is (PF_{11}) = 0.097 (herbicide) + 0.097 (BOD) + 0.096 (NO_3^-) + 0.094 (OP) + 0.094 (carbamate) + 0.092 (PO_4^{3-}) + 0.091 (NH_3) + 0.088 (pH) + 0.085 (SS) + 0.084 (TDS) + 0.081 (EC). To reduce the suitable parameters for equation to represent the WQI, it was found that equation with 11 parameters showed no significant difference at 95% with the result from the equation with 2 parameters. The reduced WQI equation is WQI (PF_2) = 0.500 (BOD) + 0.500 (NO_3^-). The WQI of drainage water from paddy field in Bangban irrigation project, Phra Nakhon Si Ayutthaya province, by using collected water quality data showed the average values of 68.31 and 64.73, from the equations with 11 and 2 parameters, respectively. These values fell into level 2 water quality that could be drained to natural water source but should be monitored closely.