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Estimating the unit domestic emission of biological oxygen demand and *Escherichia coli* in Hanoi, Vietnam

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Direct discharge of domestic blackwater to urban rivers is a common sight in urbanized areas in developing countries, and many development projects are undergoing to improve such situations to achieve sustainable water environment. To estimate the effect of the sewerage development on urban water environment, along with other influencing factors such as population increase and climate change, a scientific model to simulate water quality of four urban rivers in Hanoi, Vietnam, was developed using the Water Evaluation and Planning (WEAP) software. In estimating concentrations of Biological Oxygen Demand (BOD) and *Escherichia coli* in the rivers, it is necessary to obtain unit emission rates of these parameters. While Vietnam National standard (TCVN 7958:2008) has proposed a value range (30-35 g/capita/day) for the unit domestic emission for BOD, there is no such value range for *E. coli.* Moreover, recent studies done in Hanoi showed that the values recommended in TCVN 7958:2008 underrepresent the actual emission, hence the existing wastewater treatment facilities should be redesigned with actual influent wastewater quality for better treatment.

Considering the above, this study was conducted to estimate the unit domestic emission of BOD and *E. coli* in central Hanoi. Different unit emissions of BOD and *E. coli* were used to simulate BOD and *E. coli* concentrations in wastewater. These simulated values were compared with the observed concentrations of BOD and *E. coli* in four waste water rivers in Hanoi in 2009. Least square regression using the simulated values and observed values was performed to get the most suitable unit emission of BOD and *E. coli*. We found that BOD; 31.12 g/capita/day and *E. coli*; 2.9 ×1011cfu / 100mL /capita/day, give the closest simulated BOD and *E. coli* concentrations to the observed BOD and *E .coli* concentrations in waste water rivers..

Keywords: Biological oxygen demand, *Escherichia coli*, Simulation