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Industrial effluent impact assessment of the major river system and agriculture soil in Hanoi City, Vietnam

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Hanoi, the capital of Vietnam is experiencing rapid economical development and urban expansion. The lack of appropriate city planning and un-enforced regulations for domestic and industrial wastewater discharges is having a very damaging environmental impact. This study assessed the environmental impact of urbanization in Hanoi by investigating the extent of metal pollutants such as copper (Cu), lead (Pb), zinc (Zn), cadmium (Cd), chromium (Cr) and nickel (Ni) in Tolich River and Kimnguu River, the two major water sources in Hanoi City. These rivers are the only sources of water for irrigation of the agricultural areas and fish farming. Water, sediments and soil samples were collected and characterized. The results indicated that the stream water has extremely poor quality, with extremely low BOD, pH as high as 11 and high metals concentrations exceeding the Vietnamese water standard limits. The metal concentrations in water and sediments are directly related to industrial discharges along the rivers and transportation activities where leaded gasoline is still in use. The agricultural soils also contain high metal concentrations.