5.3 Assessment of Heavy Metal Pollution in the White Nile River in the Sudan

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This study was carried out to investigate the level of heavy metal pollution of the White Nile River in Sudan. Three locations were selected to represent high, medium and low pollution-risk areas. Location 1, in the river port town of Kosti, represented a high pollution locality. Location 2 at Elfeteihab, near an industrial area in the capital city, Khartoum, was a medium pollution-risk area. Location 3, at the Elshagara research station south of Khartoum, represented areas considered to be at lowest risk of heavy metal pollution. At each location, concentrations of the heavy metals copper (Cu), cobalt (Co), lead (Pb), cadmium (Cd) and nickel (Ni) were measured in water and sediment samples as well as in the flesh of a bioindicator fish, the Nile Tilapia (*Oreochromis niloticus*), using atomic absorption spectroscopy. Fish sediment and water samples collected from Location 1 showed the highest level of contamination with heavy metals. Accumulation of heavy metal contaminants in fish samples from this area was clearly associated with their concentration in sediment and water. The high levels contamination was attributable to oil spills and other activities at the river port. Because the concentrations of heavy metal contaminants were found to be less than the permissible values recommended by the World Health Organization, it is concluded that water and fish from the sampled areas of the White Nile are safe for human consumption. However, due to the accumulative nature of these contaminants and the likely future increase in contaminant discharge into the river, continued monitoring is highly recommended.