

**EFFECT OF USING DIFFERENT TYPES OF IRRIGATION WATER ON THE
SOIL-TO-CROP-TRANSFER FACTOR IN LEAFY VEGETABLES GROWN ALONG
PERI-URBAN AREAS OF KIAMBU COUNTY, KENYA**

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Abstract

The water used for irrigation has a significant effect on the way heavy elements accumulate in the soil as well as how plants grown on those soils uptake elements. Therefore, this study aimed at establishing the effect of using different types of irrigation water on the soil-to-plant transfer factor for leafy vegetables grown on the peri-urban areas of Kiambu County, Kenya. For this study the selected crop was the African nightshade (*Solanum Scabrum* Mill). Randomized complete block design was used to grow the crop samples in the field for a period of 30 days between July and August 2017. Four types of water (tap water, borehole water, shallow well water and wastewater) were considered as the four treatments and replicated four times. From the results, the level of Cd²⁺ and Pb²⁺ in the soils which were 2.63 ± 0.10 and 3.77 ± 0.10 ppm respectively were above the World Health Organization acceptable limits. For the crop samples that were irrigated using wastewater, a high level of Fe³⁺ was recorded 224.59 ± 14.59 ppm though not above the WHO limits. The soil-to-crop transfer factor values (TF) for crops grown using shallow wells had a value >1, an indication that this type of water positively influences the uptake of these elements. The TF values for Cd²⁺ AND Pb²⁺ in crop samples grown using tap water were < 1 at 0.95 and 0.97 respectively which signify the ability of tap water to suppress uptake of heavy elements by plants. Based on the results, it is notable that the quality of water

used for irrigation affects the way in which plants accumulates elements from the soils. It is recommendable for policy makers in the study area to educate the farmers on the need to carry out phytoremediation as one of the innovative risk-reduction interventions measures in regard to bioaccumulation.

Key terms: Soil-to-plant transfer factor (TF), Tap water, Borehole water, Shallow well water Wastewater, *Solanum Scabrum*.