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## Heavy metal accumulation of vegetables grown in urban agriculture irrigated with wastewater in Addis Ababa

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**Statement of the Problem:** Addis Ababa town is the capital of Ethiopia and the seat for the African Union with a total of 4 million populations. 65% of the total industries in Ethiopia are located in Addis Ababa and were established before the issuance of laws on pollution, thus they didn't establish waste treatment plant and they are located within 10-30 meters from the Akaki river and their wastewater is directly discharged to the river. Bioaccumulation of seven heavy metals: arsenic, cadmium, chromium, iron, lead, mercury and zinc in ten vegetable types: beet root, cabbage, carrots, cauliflower, kale, spring onions, potatoes, lettuce, swiss chard, and peppers were determined in nine farms in Addis Ababa both of which are irrigated with the wastewater of Akaki river. 32 wastewater samples, 45 composite soil samples, and 41 vegetable samples were collected from the vegetable farms and were analyzed for physicochemical parameters and heavy metal concentration. Water analysis result showed that physicochemical parameters: total suspended solids, phosphorus, BOD5, COD, and fecal coliforms and Iron, copper and mercury are found above the recommended maximum limit. It is found that the pH value of soils for 90% of the sites was alkaline. Heavy metal analysis of soils showed that iron exceeds the limit in all the sampling sites, chromium in Asco and lead in Kera site. Vegetable analysis showed that chromium and lead by far exceed the limit in almost all samples. Furthermore mercury and iron exceed the limit in 50% of the vegetable samples. Vegetables have a different capacity of bioaccumulation for heavy metals, attributed to varied physiology and soil pH. Heavy metals are environmentally stable, non-biodegradable, toxic to living beings and tend to accumulate in plants and animals causing chronic adverse effects on human health.

## **Biography**

Addisu Gebremedhin Atsibha is expert in environment and climate change. He has got BSc in Biology and MSc in Environmental Science. He has been working in Environmental Protection Authority and Ministry of Environment, Forest and Climate Change as a researcher and senior environmentalist. He has practical experience in the area of pollution research, compliance monitoring, climate change, technology transfer and climate change mainstreaming. He has been the focal person to the United Nations Framework Convention on Climate change (UNFCCC) NAMA registry. He has prepared researches on pollution and participated in the revision of environmental policy, preparation of environmental strategy, national adaptation plan, technology need assessment, safeguard framework for climate change projects. Currently, he has been working as a senior environmentalist for the African Development Bank program under the Water Resource Development Fund and is general manager for the Evergreen Environment and Development Consultancy. He has participated in many national and international conferences in Ethiopia and abroad.

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