

Investigation of Soil from Selected Villages of Chokhatauri Municipality for Heavy Metal Content Using Microwave Plasma Atomic Emission Spectroscopy (MP-AES)

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Guria is one of Georgia's unique and important agricultural regions, where soils are extensively used for the cultivation of garden and vegetable crops, as well as tea and citrus fruits. In recent years, increasing attention has been paid to the content of heavy metals in the soil, as their excessive concentration can pose risks to human health and cause serious environmental concerns.

Soil contaminated with heavy metals represents a significant threat not only to ecosystems but also to human life. When agricultural products - such as vegetables, fruits, tea, and others - are grown on such soils, the contamination is eventually transferred to consumers, increasing the risk of heavy metal bioaccumulation in the human body.

The Guria region, particularly the Chokhatauri municipality, is characterized by intensive land use and specialization in certain crops. Over the years, various agrochemicals and plant protection agents have been actively used, which may have contributed to the accumulation of heavy metals in the soil.

Soil samples from several villages in the Chokhatauri municipality (Guturi, Kvakude and ZemoErketi) were analyzed for the content of heavy (Cd, Pb, As, Zn, Cr, Cu, Ni, Mo, Sb, Mn and Fe) and alkali (Li, Na, K) metals using the Microwave Plasma Atomic Emission Spectroscopy (MP-AES) method. Based on the obtained data, the distribution patterns of heavy metals and the region's geochemical environmental status were assessed, providing essential information about the ecological conditions and sustainable use prospects of soil resources in the region.