

## **Correlation of heavy metal content in water to the development of CKD in Ranau, Sabah**

### **ABSTRACT**

The negative health impact caused by chronic heavy metal poisoning in Malaysia has raised an awareness to institute to form early screening programs in high-risk populations. Recently, Ranau had been alarmed by a sudden spike in patients with kidney failure, reporting of 7 cases from Kg. Libang, 4 cases from Kg. Kinapulidan and Kg. Matan respectively, and many more villages affected. With the CKD cases concentrating in the district, 2 possible causes are: water sources contaminated with heavy metals via acid mine drainage from the ex Mamut copper mine and the bioaccumulation of heavy metals in the crops from agricultural chemicals and/or pre-existing heavy metals in the soil. Therefore, this entails the need to detect the damages in its early stages. Preventive measures can come in the form of environmental monitoring i.e., testing the water and soil for heavy metals that are known to be toxic and carcinogenic. This study aims to develop a method to determine heavy metals that are below the detection limit of the conventional instruments outside of a clean room setting, such as ICP-MS analysis, noting that concentration that fall below sub-ppt level cannot be detected by all types of instruments available in the market. The soil quality was previously reported as significantly contaminated. However, none have linked the contaminated soil to the water sources and the consequences on human health because of the undetectably low levels of heavy metals present in the water. Mine site rehabilitation procedures and educating the farmers are solutions to prevent further heavy metal damages towards the surrounding environment. Nonetheless, this post as a costly and challenging procedure to be carried out. Meanwhile, the district provides an excellent opportunity for future research to better understand the relationship between heavy metals and human health in the context of medical geology.