

## **STUDY OF CONTAMINANT DISTRIBUTION Cd AND Pb METALS IN AGRICULTURAL SOIL, PIYUNGAN DISTRICT, BANTUL REGENCY, SPECIAL REGION OF YOGYAKARTA**

Nindhita Rosiana

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### **ABSTRACT**

The determination of heavy metals Cd and Pb have been carried out in agricultural soil of rice plants (*Oryza sativa L.*), Piyungan District, Bantul Regency, Special Region of Yogyakarta. The aims of this research were to study the physico-chemical properties of the accumulation of Cd and Pb metals in the soil, to study the source of the Cd and Pb on the agricultural, as well as to assess the impact of Cd and Pb metals on humans and the ecology.

The research was began by sampling soil and water samples, in September and November 2022, as well as sampling plant samples in Desember 2022 when the harvest season arrives. Soil was analyzed with several parameters, namely determination of soil texture, water content, pH (H<sub>2</sub>O and KCl), cation exchange capacity (CEC), organic carbon, exchangeable cations (K, Na, Ca, Mg), total Cd and Pb content, dissolved Cd and Pb, determination of functional groups in the soil, and determination of soil minerals. Plant samples were analyzed for total Cd and Pb on rice and its steam. In addition, an analysis of total Cd and Pb content in river water and fertilizer used by farmers was also carried out to determine the source of Cd and Pb at the study site.

The results showed that the research location had very high soil pH, CEC, exchangeable cations (K, Na, Ca, Mg), moderate organic C, and clay-dominated soil texture so that little Cd and Pb metals were in dissolved form. The condition of the research location has a high to very high pollution load index value. However, the potential ecological risk is low to moderate. The sources of Cd and Pb pollution at the study site are thought from human activities, such as river water and the used of inorganic fertilizers containing Cd and Pb. The content of Pb metal has accumulated in rice seeds even in small concentrations, meanwhile Cd metal has not accumulated in rice plants.

**Keywords:** cadmium, lead, rice, river water, soil.