UNIVERSITI TEKNOLOGI MARA

# DETERMINATION OF HEAVY METAL CONCENTRATION IN SOILS AND SELECTED VEGETABLES AT EX-MINING AREA, BESTARI JAYA AND ITS POTENTIAL HEALTH RISK

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**Project submitted in fulfilment of the requirements**

**for the degree of**

**Bachelor of Environmental Health and Safety**

**Faculty of Health Science (Hons)**

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**Declaration by Student**

Project entitled "determination of heavy metal concentration in soils and selected vegetables at ex-mining area, Bestari Jaya and its potential health risks" is a presentation of my original research work. Wherever contributions of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of my project supervisor, Prof Madya Rodziah Ismail. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

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## ABSTRACT

**Determination of Heavy Metal Concentration in Soils and Selected Vegetables at Ex-Mining Area, Bestari Jaya And Its Potential Health Risk**

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**Introduction**: Consumption of green leafy vegetables containing heavy metals especially grown in previously anthropogenic polluted areas such as landfill and mining areas is identified as one of the routes for these contaminants to be accumulated in human body which resulting to various health effects such as dysfunction of renal system, destruction of liver and anaemia. **Objective:** This study is done to determine the concentration of heavy metals (Cu, Pb, Cd, Mn, Ni, Zn, Fe) in the selected vegetables and with the associated soils. **Methodology:** Thirty samples for each types of vegetables (spinach and mustard green) and their corresponding soils were taken at the Upol's agricultural field to be digested at the laboratory by using acid digestion before being analysed with Atomic Absorption Spectrophotometer (AAS). **Results:** From the findings obtained, the concentration of heavy metals Pb (0.46 mg/kg), Cd (1.0 mg/kg), Ni (5.18 mg/kg) and Zn (107.7 mg/kg) in spinach while the level of Pb (0.31 mg/kg), Cd (0.62 mg/kg) and Ni (4.34 mg/kg) in mustard green were exceeded the allowable maximum levels of heavy metals recommended by World Health Organization (WHO). However, the concentration of heavy metals in the soils were below permissible limits recommended by WHO. The concentration of these heavy metals in vegetables then were used to evaluate the potential health risk based on the hazard quotient (HQ) among the consumer at Bestari Jaya, Selangor. The value of HQ for Cd, Zn and Mn were more than 1 indicated the consumption of these types of vegetables tend to pose a health risk among the consumer. **Conclusion:** It is compulsory to monitor and assess the concentration of heavy metals in plant tissues at every agricultural field to avoid the accumulation of these contaminants in human food chain and to enhance the quality of life among vegetables consumers at Bestari Jaya specifically.



*Keyword: Heavy metals, soils, spinach, mustard green, health risk*