

The Potential of Fly Ash Wastes to Improve Nutrient Levels in Agricultural Soils: A Material Flow Analysis Case Study from Riau District, Indonesia

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Abstract : Fly ash sewage of pulp and paper industries when processed with suitable process and true management may possibly be used fertilizer agriculture purposes. The objective of works is to evaluate re-cycling possibility of fly ash waste to be applied as a fertilizer for agriculture use. Fly ash sewage was applied to maize with 28 g/plant could be increased significantly the average of dry weigh from dry weigh of seed increase from 6.7 g/plant into 10.3 g/plant, and net assimilation rates could be increased from 14.5 mg.m⁻².day⁻¹ into 35.4 mg.m⁻² day⁻¹. Therefore, production per hectare was reached 3.2 ton/ha. The chemical analyses of fly ash waste indicated that, there are no exceed threshold content of dangerous metals and biology effects. Mercury, arsenic, cadmium, chromium, cobalt, lead, and molybdenum contents as heavy metal are lower than the threshold of human healthy tolerance. Therefore, it has no syndrome effect to human health. This experiment indicated that fly ash sewage in lower doses until 28 g/plant could be applied as substitution fertilizer for agriculture use and it could be eliminate the environment pollution.

Keywords : fly-ash, fertilizer, maize, sludge-sewage pollutant, waste

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