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## Fertiliser Derived from Fecal Sludge in Sri Lanka: Analysis of Plant Nutritional Value and Heavy Metal Contamination

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### Abstract

Urban and rural areas in developing countries face major challenges in closing the nutrient and carbon resource loop. To address this issue, IWMI implemented a resource recovery treatment scheme to recycle fecal sludge and organic municipal solid wastes by jointly co-composting input materials from these two waste streams. The implementation took place in Ghana initially and resulted in a commercially available fertiliser. Sri Lanka was chosen to be one of the countries for further implementation and evaluation where the current focus is on the safe production of co-compost, agricultural application, economical viability of compost plants, value chain development and demand analysis. The data presented in this paper aim to link research findings of the pellet production process with options and potentials for agricultural application. Therefore, different types of compost and co-compost have been analysed for macro- and micro plant nutrients, organic matter, pH-value, electric conductivity and heavy metals. While composted fecal sludge from septic tanks (FS) displays like farmyard manure high levels of some micronutrients-cum-heavy metals, the co-composts with rice husk (FS-RH) or organic municipal solid waste (FS-MSW) show all levels in the desired range. The process of co-composting allows to create a nutrient and organic carbon rich agricultural resource, which can further be enriched according to crop demands or ease of handling through mineral enrichment or pelletizing. Results reveal that pelletizing e.g. FS and MSW maintains the chemical properties while enhancing product value, e.g. for storage, transport and controlled field application. Based on the obtained results, it can be concluded that an enriched and pelletized FS-MSW co-compost presents an interesting alternative to conventional fertiliser and soil amendments, especially in Sri Lanka where there is a strong political push for organic fertilisers. Ongoing research is addressing farmers' demand and other potential contaminants targeting its certified organic agricultural use.

**Keywords:** Compost, fecal sludge, heavy metal, plant nutrient