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## Wastewater use in agriculture in Sri Lanka: A case study from Kurunegala Sri Lanka

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Wastewater management, including treatment, is vital to protect human health and prevent the contamination of lakes and rivers; but for most developing countries this solution is prohibitively expensive. In such cases, applying wastewater to agricultural lands is a more economical alternative and more ecologically sound than uncontrolled dumping of municipal effluents into lakes and streams, as it offers a form of land based treatment. In rural and peri-urban areas of many developing countries, the use of sewage and wastewater for irrigation is common practice. This is often due to water scarcity but even in areas where other water sources exist, small farmers may choose wastewater because of its high nutrient content, which reduces the need for expensive chemical fertilizers. The use of wastewater in agriculture is thus a form of nutrient and water recycling; and this often reduces downstream environmental impacts on soil and water resources. The outcome of this is improved livelihoods, food security and nutrition for many urban low income households. Despite these benefits uncontrolled use of wastewater may be associated with significant negative human health impacts due to the pathogens contained in the wastewater. Sri Lanka is no exception to this situation and yet wastewater agriculture in Sri Lanka is much less studied than in other countries and is happening unnoticed at present. The objective of this paper is to explore the wastewater use in agriculture in the city of Kurunegala and to suggest the way forward to better wastewater management and reuse.

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## Utilization of sewage sludge as a potting media for tree nursery

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Dumping of sewage sludge in the outer of cities leads to silting of nearby tanks, polluting the lands and also air they burn, which is a burning problem in urban areas. This sewage sludge is rich in nutrients and their use has been found to improve the physical condition of the soil as well as increase productivity of green biomass. As it contains heavy metals it threatens the human life by way of entering into food chain. Hence, the best possible alternative is to utilize the sewage sludge as a potting media for raising tree seedlings in tree nursery especially timber, energy and industrial wood species. An experiment with an objective of utilizing sewage sludge as a potting media for tree nursery was conducted at Tamil Nadu Agricultural University, Mettupalayam with different potting media mixtures as treatments viz., T<sub>1</sub> – Soil + Sand + FYM (1:1:1 ratio); T<sub>2</sub> – Soil + Sand + Raw Sewage Sludge (1:1:1 ratio); T<sub>3</sub> – Soil + Sand + 2 weeks Composted Sewage Sludge (1:1:1 ratio); T<sub>4</sub> – Soil + Sand + 4 weeks Composted Sewage Sludge (1:1:1 ratio); T<sub>5</sub> – Raw Sewage Sludge alone; T<sub>6</sub> – Two weeks Composted Sewage Sludge alone and T<sub>7</sub> – Four weeks Composted Sewage Sludge alone. *Eucalyptus tereticornis*, *Tectona grandis*, *Azadirachta indica*, *Casuarina equisetifolia* and *Acacia nilotica* were them grown in polythene bags containing the above potting media. Plant height and collar diameter at two intervals viz., 3 months and 6 months after transplanting and drymatter production at 300 DAT were recorded. The results revealed that the plant height of the *E. tereticornis* and *T. grandis* at 3 months after transplanting was significantly higher in T<sub>6</sub> whereas the plant height of the other three tree species viz., *C. equisetifolia*, *A. indica* and *Acacia nilotica* was significantly higher in T<sub>3</sub>. At 6 months after transplanting the plant height of all the tree species significantly higher in T<sub>4</sub>, T<sub>3</sub>, T<sub>5</sub>, T<sub>4</sub> and T<sub>4</sub> respectively. At 10 months after transplanting *E. tereicornis*, *T. grandis* and *C. equisetifolia* recorded the maximum dry matter in T<sub>5</sub> whereas *A. indica* and *A. nilotica* recorded maximum dry matter in T<sub>7</sub> and T<sub>3</sub>. Though the sewage sludge is having sufficient major nutrients, it has heavy metals especially, lead, chromium, nickel and cadmium. In this context, the nutrients and heavy metals present in the potting media were analyzed at initial and 300 DAT of seedlings. The results showed that the potting media have considerable quantity of major nutrients and heavy metals also. But the tree seedlings have absorbed the heavy metals from the potting media to some extent. Hence, sewage sludge which has toxic substances or heavy metals could be used as a potting media for raising tree seedlings especially energy, industrial and timber species as they do not affect the food chain. It is concluded that Sewage sludge is an effective substitute to farm yard manure and could be used as a potting media in forest nursery on a large scale.