Deriving a Planting Medium from Solid Waste Compost and Construction, Demolition and Excavation Waste

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Lebanon's very high population density has been increasing since the end of the war in the early 1990s reaching 416.36 people per square kilometer. Furthermore, the influx of refugees from conflicts in the region has increased the resident population significantly. All these are exerting pressure on the country's natural resources, pushing the Lebanese to convert more forest and agricultural land into roads, buildings and houses. This has led to a building boom and rapid urbanization which in turn has created a demand for construction material – mainly rock, gravel, sand, etc. nearly all of which were locally acquired through quarrying to the tune of three million cubic meters annually. This boom has been followed by a war with Israel in 2006 which resulted in thousands of tonnes of debris. The increase in population has also led to an increase in solid waste generation with 1.57 million tonnes of solid waste generated in Lebanon per year.

The combination of construction, demolition and excavation (CDE) waste along with the increase in solid waste generation has put a major stress on the country and on the management of its solid waste problem. Compounding this problem are the issues of quarries closure and rehabilitation and a decrease in forest and vegetative cover.

The on-going research reported in this paper aims to provide an integrated solution to the stated problem by developing a "soil mix" derived from a mélange of the organic matter of the solid waste (compost), the CDE waste, and soil. In this mix, native and indicator plants are planted (in pots) from which the most productive mix will be selected for further testing at field level in later experiments. The plant species used are Matiolla, a native Lebanese plant and Zea mays, which is commonly known used as an indicator plant due to its sensitivity to environmental conditions. To ensure sustainability and environmental friendliness of the mix, its physical and chemical characteristics are monitored and assessed. The leachate from the irrigation of the pots is also monitored and assessed to ensure that if selected for field trials, the mix will not pose a threat to water bodies. The presentation at the conference will aim to report the latest results from the on-going experiment.