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Recycling and utilization of solid organic wastes in agriculture for sustainable environment

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The solid waste produced in urban areas of India is approximately is about 62 million tonnes per year, and is expected to increase by 4% per year out of which nearly 50% of the total waste is organic (McKinsey Global Institute 2010). With landfills ranking third in terms of greenhouse gas emissions in India, the vision for waste management in India is the recycling and reuse of wastes as resources. Improper handling of solid wastes results in serious environmental pollution of soil, water and air. Proper waste management generates useful by-products and creates a circular economy. In this regard, research was conducted on the utilization of solid organic wastes in agriculture i.e., EM (enriched microbial) compost prepared from the sludge obtained from secondary treatment of industrial effluents; compost prepared from urban waste; sewage sludge obtained from the sewage treatment unit; biogas manure obtained from biomethanation of poultry droppings; biochar obtained from the pyrolysis of crop residues subjecting to thermo-chemical conversion process (pyrolysis) at low temperatures (~350–600°C) in an environment with little or no oxygen with humic acid as amendment. All the above mentioned organic wastes were characterized and found prima face that they comply with standards of MoEF, India, opening up the thought of utilizing as carbon/nutrient source in agriculture. Soil column studies were conducted aiming to study the threat of heavy metals being added to ground water and to agricultural soils on application of these organic wastes and their impact on crops yield and quality was also evaluated. The test crops reviewed were –okra, rice, maize, mari gold and golden rods..