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Issues And Challenges In Utilisation Of Plastic Wastes In Solid Waste Management

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Abstract : This report focuses on various options available for the disposal of municipal plastic solid waste (MSW) sustainably and attempts to provide a documented picture of their suitability to India. The areas of focus were Recycling, Aerobic Composting (or Mechanical Biological Treatment), Small Scale Biogas (or Biomethanation), Refuse Derived Fuel (RDF) and Waste-to-Energy Combustion (WTE). These technologies were selected based upon their success inside and outside India, suitability to Indian conditions, environmental impact and economics. Composting and small scale biomethanation were chosen specifically due to their success in India in treating organic wastes. Composting was also chosen to point out a likely side-effect of mixed waste composting. Mixed waste composting is also called as Mechanical Biological Treatment (MBT). Use of compost from MBT facilities for agricultural purposes introduces heavy metals into human food chain. Small scale biomethanation was chosen due to its high position on the hierarchy of sustainable waste management and its collective potential to divert waste from landfills. Informal recycling is studied as an integral part of SWM considering its effectiveness in recycling waste and its robust collection and supply chains in large Indian cities. Informal recycling is getting due recognition and gaining wider consensus around the world for its role in SWM in middle and low income nations. RDF and WTE are chosen based upon their potential to divert wastes from landfill and their potential to generate energy from residual mixed wastes. Failures of RDF and WTE plants are analyzed and compared to the initial failures of MBT plants. Despite the best waste handling practices, a fraction of MSW that has to be landfilled will always exist; therefore an introduction to sanitary landfilling is included as an end-of-the-loop solution.