Pollution Control and Environmental Restoration Techniques for Solid Waste Landfills in Sri Lanka

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Landfills are the most common way of disposing municipal solid waste in developing countries due to low cost compared to other waste management techniques. In the case of Sri Lanka, most of waste landfills are operated as unmanaged and uncontrolled open dumpsites as a result of lack of engineered technologies and capacities of operation and maintenance. Open dumping of solid waste under unsanitary conditions causes various kinds of problems: 1) Damage to human health surrounding the dumping sites (water-born infectious diseases), 2) Environmental pollution (water, air, soil, and sea), 3) Disaster (landslide, explosion), and 4) Global warming (emission of greenhouse gases). In order to prevent such problems, appropriate techniques for pollution control and environmental restoration should be adopted. Based on agreement between Sri Lanka and Japan, the JST-JICA SATREPS (Science and Technology Research Partnership for Sustainable Development) project began in April 2011 and continued until March 2016. One of main activities in the SATREPS project was to develop pollution control and environmental restoration techniques for solid waste landfills.

The project was aimed especially to develop pollution control and remediation techniques with site-specific, low-cost, sustainable, environmentally friendly, and engineered easy-construction. The research components in the activity were 1) Leachate treatment, 2) Surface lining and seepage control, 3) Geomechanics and slope stability, 4) Landfill capping, and 5) Permeable reactive barrier for in-situ contaminant treatment of groundwater. Effectiveness and performance of the appropriate techniques which were developed have been evaluated not only by laboratory tests but also by field experiments.

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