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While population growth has often been identified as a driving force behind soil degradation, indiscriminate disposal of unsorted domestic solid waste in unsanitary landfills is also a major contributing factor. As developing countries achieve economic progress and greater affluence, the composition of domestic solid waste changes from primarily biodegradable organic materials to plastic and other synthetics that take much longer to decompose, if they do at all. As domestic solid waste continues to increase in both absolute and per capita terms in the region there is an urgent need for its cities and towns to apply environmentally sound technologies to solid waste disposal.

Given its vast number of rapidly growing cities and towns, the Government of the People's Republic of China is well-aware of the urgent need to thoroughly test environmentally-responsible methods of safely disposing of the equally rapidly increasing urban solid waste in sanitary landfills. With this in mind, the ROAP-Fukuoka and China's Ministry of Construction have been exploring the feasibility of introducing a semi-aerobic landfill system, known as the *Fukuoka Method*, to cities in China. The *Fukuoka Method* is designed to minimise landfill investment and maintenance costs and to provide highly 'environmentally friendly' results. Currently, 70 per cent of municipal landfills in Japan are of this type.

Fukuoka Method leachate collection pond in Weifang City, China.



Fukuoka City and Fukuoka University are providing the ROAP-Fukuoka with all the necessary advisory support in this environmental protection technology transfer effort. The first pilot project in China was launched in 2002 at Weifang City, Shandong Province. Starting with a detailed design for a semi-aerobic landfill site, the landfill construction was completed the following year. Close monitoring of the landfill gases and of leachate at the pilot site over four successive years found both to be comparable to those normally found in a well-functioning landfill site of this type and age.



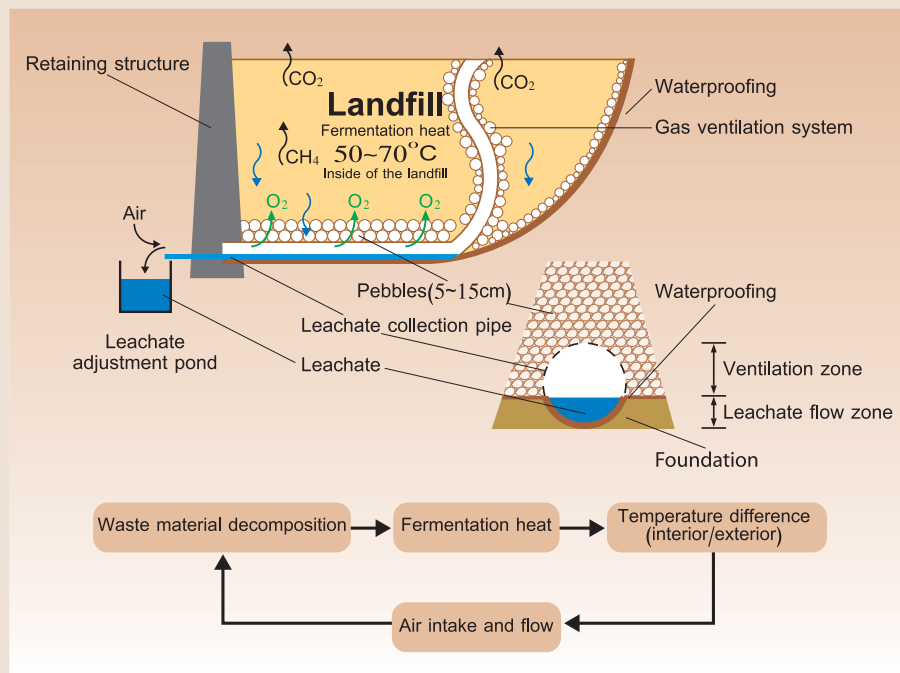
Fukuoka Method landfill in Weifang City, China.

The successful introduction and replication of the *Fukuoka Method* in China would bring about substantial reductions in the amount of land required for garbage disposal, as well as significant reductions in greenhouse gas emissions and leachate contaminants. Such reductions would, in turn, help reduce the negative environmental consequences of the high-speed, 'mega'-urbanisation expected in China in the coming decades.

The Fukuoka Method

Advantages of semi-aerobic landfill:

- Leachate is discharged as soon as it is collected, thereby, reducing seepage.
- Fresh air brought in through pipes enhances waste stabilisation, improves leachate quality, and reduces the cost of final leachate treatment.
- Gas pressure is dissipated through ventilation pipes, reducing the chance of an explosion.
- Waste is compacted, thereby, reducing the footprint of the landfill.
- Waste stabilisation occurs more quickly, making reuse of the land possible sooner for vegetation, open space, parks, recreation, schools, etc.
- Helps mitigate global warming by reducing the amount of CH₄ (25 times more harmful than CO₂) produced.
- Initial investment and maintenance costs are lower than the aerobic landfill.



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