HEALTH RISK ASSOCIATED WITH MANAGEMENT OF MUNICIPAL SOLID WASTES IN MALAYSIA

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Population of Malaysia in 2016: estimate 31,077,000
Average per-capita waste generated/person
0.85 kg/person/day
1.5 kg/person/day (major cities)

Rate of waste generation in Malaysia is increasing due to:

a) Community activities – commercial, institutional, industrial, markets.
b) Economic activities.
c) Type of waste generator and land use
Solid Waste Management in Malaysia

CURRENT SWM FRAMEWORK

Solid Waste can be collected by any collector and transported anywhere without control.
Problem Statement

• Separation at source between recyclables and non-recyclables are done on voluntary basis by Malaysians

• Collection mechanism done by contractors appointed by Local Authorities. A two plus one (2 + 1) collection system: 2 days for residual and 1 day for recyclable waste

• This year the government will make it compulsory for Malaysian household to separate the waste at source
Problem Statement

- Open Dumping
Open Dumps

- Problems:
  - Breeds pests
  - Health hazard
  - Cause of water pollution
  - Air pollution
  - Odor and smoke nuisance
  - Fire hazards
  - Unsightly
### Composition of Malaysian MSW

<table>
<thead>
<tr>
<th>Composition</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organics</td>
<td>46.97</td>
</tr>
<tr>
<td>Plastic</td>
<td>20.28</td>
</tr>
<tr>
<td>Paper</td>
<td>17.89</td>
</tr>
<tr>
<td>Metal</td>
<td>4.31</td>
</tr>
<tr>
<td>Glass</td>
<td>2.60</td>
</tr>
<tr>
<td>Inorganics</td>
<td>0.17</td>
</tr>
<tr>
<td>Others</td>
<td>7.81</td>
</tr>
<tr>
<td>Average Moisture Content</td>
<td>55</td>
</tr>
</tbody>
</table>
Potential Health Risk from Open Dump

- *Salmonella* spp. in solid wastes comes from food wastes. Among the 2000 serotypes of *Salmonella* spp., two serotypes, namely *Salmonella*, *S. typhi* and *S. paratyphi* (A, B, C), are the most dangerous to people.

- The most common pathogenic bacteria in municipal solid wastes include *Clostridium perfringens*, *Escherichia coli*, *Listeria monocytogenes*, *Pseudomonas aeruginosa*, *Salmonella* spp., *Staphylococcus aureus*, and *Klebsiella* spp. Most of these pathogens originate from food wastes.
A wide range of fungi, such as Aspergillus spp., produce several types of toxins. The ability of fungal spores to survive in the environment has also been reported in the literature. Şahil and Otag (2013) [21] indicated that Aspergillus spp., Fusarium spp., Acremonium spp., Alternaria spp., and Cladosporium spp. can survive for more than one year in sand at room temperature.
Segregation, treatment, recycle and disposal

- Wastes generated are segregated, treated whenever needed and then recycled or disposed off at 165 disposal sites all over the country which cater up to 95% of Malaysian waste.

- However, about 80% of these open dumps have almost reached full capacity and are expected to be shut down over the next few years.
Approved Land-fill Sites in Malaysia, 2013

We already have too many land fill site, and 80% of them have reached it's useful life also. It is high time for us to seriously think about recycling our waste.

80% have reached maximum useful life!
## Current Challenges in SWM in Malaysia

**LANDFILL.** Authorities in major cities in Malaysia are studying other waste management approaches. Among them is an approach to move away from unsanitary landfills.

**INCINERATION.** is the second mostly used method to manage waste in Malaysia. It is one of the most effective means of dealing with various types of wastes.

**INCREASING COST.** 40% - 80% of Local Authority expenditure is on managing solid waste and public cleansing. In this situation, LA is in most cases incapable of responding to this high cost expenditure, so government outsource.

**PUBLIC AWARENESS.** The government has launched several recycling campaigns since the early years of 2000 to involve the participation of NGOs and community groups, unfortunately not that successful. Data has shown 85% of Malaysian know about recycle, but only 15% did recycled.
CARA KITAR SEMULA
(ART OF RECYCLING)

Barangan Kitar Semula
- Botol minuman ringan & jus
- Bekas jem & makanan
- Botol sos & perasa
- Botol vitamin & kosmetik
- Kertas komputer
- Surat khabar & majalah
- Buku panduan, buku sekolah & cerita
- Kertas hitam & putih (A4, F4,..)
- Risalah & katalog
- Kalender, pos kad & kad ucapan, bungkusan pos & resist, fail kertas & sampul
- Surat, kotak kertas
- Tin aluminium, semua tin minuman ringan & tin minuman lain
- Tin makanan & sos, tin serbuk minuman (contoh: susu & Milo), tin biskut & makanan lain (tanda dimampatkan)
- Titik dan Aluminiun
- Botol minuman ringan & jus
- Botol minuman air mineral
- Bekas makanan & sos
- Bekas sabun cecair & detergen, botol vitamin
- Botol sampo & losyen
- Beg plastik
- Sabut diikat
- Basuh, kering & kemekkan

Barangan Tidak Boleh Dikitar Semula
- Tisu & tuala kertas
- Kertas karbon pembungkus makanan
- Keperingan aluminium & kertas lilin
- Kertas lamina
- Kertas pasir & lampin
- Cawan & pinggan
- Pinggan kristal & ketuah cermin, cermin kereta & panel tingkap, mental porselin & seramik
- Bekas berbahana tokok, akuarium
- Tin cat & bahan bertoksik
- Radas makmal pen "styrofoam"
- Tin cat & cecair bertoksik lain seperti gam & pelarut
- Tin aerosol
- Kasut
- Beg bateri
- Termometer

Simbol-simbol kitar semula untuk plastik

PETE
HDPE
V
LDPE
5
6
OTHER

Semua jenis bungkusan karton minuman & makanan
Bilas bungkusan karton
Rata & ikatkan
Tuangkan baki air
Basuh, kering & mampatkan
Solution For My And Your Food Waste

Compost Change!!!

Let's Recycle Your Food Waste
Contoh bakul yang boleh digunakan (bebas yang mempunyai rongga udara/liang udara)

Nota:--
Berat medium pengurai yang sesuai untuk sebuah rumah adalah:
3 kg (2kg tanah + 1kg sekam)
COMPOST CHANG

FUNGAI PENAPAIAN @ SEED COMPOST

MANUAL PENGGUNAAN
1. Sisa makanan dipotong kecil
2. Sisa makanan dibilas & ditapis
3. Sisa makanan dimasukkan ke dalam bakul kompos, digaulkan bersama medium penguraianan pastikan digaul serata
4. Bakul kompos ditutupi dengan kain bagi menggelakkan serangga masuk serta untuk mengekalkan suhu kompos
5. Ulang proses setiap hari sekali sehingga bekas penuh atau sehingga 3 bulan jika 500gram sisa makanan di letakkan setiap hari
6. Pastikan kompos digaul sekali setiap hari
7. Selepas 3 bulan atau sekiranya bakul telah penuh, keluarkan kompos dari bekas dan periksa kelembapanya. Sekiranya terlalu kering, tambahkan sedikit air
8. Simpan kompos di dalam kotak/bekas dan biarkan ia matang selama 2 minggu untuk ia menjadi hasil kompos
PROGRAM KOMUNITI

Gambar 1 : Penduduk yang terlibat di Kg. Paya Rumput Jaya Sg. Udang Melaka

Gambar 2 : Penduduk yang terlibat di Kg. Paya Rumput Jaya Sg. Udang Melaka
Conclusion

There are high potential of health risks from open dump of solid waste practices from certain bacteria reactions. A depth of lab analysis is needed.

A fundamental requirement for more efforts to increase effectiveness and efficiency in achieving the set objectives on solid waste management with an integrated and sustainable perspective is absolutely a necessity.
Q & A SESSION
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