7 CONCLUSIONS

This research has managed to gather vital information on waste disposal in Selangor, the socio-economic effects and important issues pertaining to waste management.

From the waste characterization and quantification study, the largest component received by disposal sites in Selangor was organic waste which contributed approximately 55% of the total waste generated. This was followed by plastic (17%) and paper (13%). Urban areas were found to generate the highest amount of waste followed by sub-urban and rural areas. Plastic waste generation was the highest from the industrial sector followed by the institutions and commercials while paper waste originated mainly from the domestic sector.

Waste sample analysis indicated that the MSW generated in Selangor was slightly acidic (pH5.5) and high in moisture content (50-60%). The calorific value of the various types of waste ranged from as high as 44,000 KJ/kg to as low as 15,000 KJ/kg and was mainly influenced by the moisture level retained in the waste.

Leachate characteristics study indicated that the pollution parameters ranged from one landfill to the other based on various factors. The pollution intensity of the leachate from the nine non-sanitary landfills was low compared to leachate from other areas due to the dilution by surface run-off. However, treatment is essential to reduce the pollution loading to the adjacent water bodies.

Physico-chemical treatment with the use of ferric chloride was found to be more efficient and cost effective in reducing various pollutants, compared to alum. The optimal concentration of ferric chloride application in coagulation and flocculation system was 0.8g/L while the optimal pH was pH4.0. Biological treatment utilizing bacterial and microbial cocktails was found to be effective in reducing the pollution parameters further. Reduction efficiency of the biological treatment ranged from 30% to 75%.

In regards to treatment of organic waste, vermi-composting was found to be the most feasible for household application. The best set-up was the flower pot layering with the use of *Eisenia feotida*. Approximately 80g of the worms can convert 500g of food waste to high quality vermi-compost within 21 days. The most suitable combination is kitchen waste with vermi-compost at 2:1.

The socio-economics study indicated that public in Selangor has high level of environmental awareness (76% of the population). However, the 'not-bothered' attitude, lack of regulations and policies, and unattractive market drive discouraged recycling among them. However, 3R can be implemented if appropriate regulations pertaining to waste management, such as Solid Waste and Public Cleansing Management Bill 2007, is in place.

Results indicated high willingness (80-90%) of the public to change if the law is stipulated accordingly. Among the changes are to be more participative in recycling, to conduct waste separation at source, to replace non-degradable plastic with degradable

plastic, to purchase more environmental-friendly products, and participation in pay-as-you-throw system.

With the changes in public attitude, the improvement of waste management system can be achieved. Current waste management was found to generate no revenue but deficit due to the lack of recycling, composting and waste to energy conversion. Model development of waste management system in Selangor for 2020 target using SWPlan indicated that the state can earn revenues from recycling and composting of the waste.

Annually, approximately RM46 million (USD 13.1 million) can be earned from composting while from recycling revenue secured would reach RM7 million (USD2 million) per year. Integrated waste management system can reduce 75% of the operating cost of landfill management with additional benefits from the economical and environmental point of view.