

## CONCLUSIONS

JSL received an average of 2100 tonne of municipal solid waste per day. The source of waste are mainly from municipality council and solid waste company (SOWACO). The cumulative waste disposed into JSL from 2007 to 2013 were 4,785,439 tonne. This study quantified C and N flows in JSL system. Kitchen waste and garden waste contribute significantly to the mass flow in landfill. They finally contributed to organic C and total N and accounted for C and N ratio in landfill. The waste composition results gave a good understanding of the waste that is deposited from different sources. The C and N flow were closely related to their respective cycles in the landfill. Inputs into landfill are mainly waste and rainfall while major outputs are mainly landfill gas and leachate. STAn software with graphic representation of C and N flow has been clearly discussed in this study. The software use has facilitated the study of sanitary landfill system in MFA framework. Detailed inventories of landfill system including waste sampling, chemical analysis in solid waste, leachate and landfill gas is important to establish the total Substance Flow Analysis (SFA) of C and N in an open system like sanitary landfill. Substance balance results from 4-year old sanitary landfill showed that in 1-year of landfilling, 29% of the input of the organic C left the landfill via gas pathway and less than 1% left via leachate pathway. While 70% of C remained in the landfill body, the largest part of total-N (almost 80%) remained as landfill stock. MFA in waste has potential to give good estimates with limited data. A possible limitation of applying MFA in landfill management in terms of availability of quantitative data on composition and stock of waste materials from landfilling process. Therefore, MFA study will support waste management decision in order to achieve sustainable landfilling practise in Malaysia. C and N was dominantly exported as landfill gas and leachate. The SFA of C and N in JSL has been established. Stock of C was 782,530 ± 0.0% tonne per year while stock of N was 3,756,144 tonne per year . Mass flow in JSL has shown that the input was 127,720 tonne of waste per year and output was 484,490 tonne per year and the landfill stock was 782,530 tonne per year.