

CHAPTER 5

CONCLUSION

The IPCC Waste Model was used to estimate CH₄ emission at JSL from the year 2010 to 2030. From the two approaches used in the model, the waste composition approach showed lesser deviation (7 to 60%) from the actual records of LFG from JSL. Fractional bias (FB) method (error function analysis) was used for each parameter and error estimate which showed more than 60% was revaluated and new figures were assigned to it with errors below $(30 \pm 20)\%$. Hence, the model parameters were used for calculating the CH₄ emission of $1826 \text{ g m}^{-2} \text{ day}^{-1}$ in the partially closed cell. The model estimated value was later compared to the surface emission of CH₄ from the flux chambers with a geospatial mean of $989 \text{ g m}^{-2} \text{ day}^{-1}$. The model estimated almost twice the flux emitted from the surface. As per the influence of meteorological parameters on CH₄ surface emissions at JSL, only rainfall had a significant impact on the CH₄ flux emission. As for the biocover material, the 7 to 3 ratio of BSG to compost mix was identified as a better material than the composted BSG. The optimal parameters of pH 6, moisture content 65% (v/v) and temperature 35°C- 40°C which was used in the column experiment, achieved 100% CH₄ oxidation in both the laboratory condition and landfill itself. In the laboratory CH₄ oxidized fastest at 50 cm within 5 days while in the landfill CH₄ oxidized fastest at 60cm within 6 days.

As a general conclusion, the landfill can become from a minor emitter of GHG to a major saver of GHG if proper waste management methods are followed. The quantification of LFG provides a lead for a landfill to plan its LFG recovery and

utilization. However, in the case of smaller landfills like JSL both the quantification methods done in this thesis may help the landfill to instill a proper cover layer or biocover to bioremediate CH_4 which is emitted from the surface. The reuse of organic waste products such as BSG as a biocover to remediate CH_4 is also a novel and new approach.