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#### ENVIRONMENTAL AND ECONOMIC FEASIBILITY OF AN INTEGRATED COMMUNITY COMPOSTING PLANT AND ORGANIC FARM IN MALAYSIA

Li Yee LIM, Chew Tin LEE\*, Cassendra P.C. BONG, Jeng Shiun LIM, Mohamad Roji Sarmidi, Jiří Jaromír KLEMEŠ

University of Technology Malaysia

# **Background of Project:**

In Malaysia,

- The population reached 31.7M in 2016 with an annual growth rate of 1.5 %
- The MSW generation increased from 22 kt/d to 30-33 kt/d
- For the collected MSW → 94.5 % to landfills, 5.5 % recycling and 1 % composting



This study is focusing on an interesting case study at Johor Bahru  $\rightarrow$ 

[composting + community farming ] = self-sustaining model

The feasibility study is based on

(1) Environmental impact via GHG quantification

(2) Economic analysis via CBA

The analyses are conducted based on two scenarios:

Scenario 1 comprises the baseline scenario where the waste is sent to open dumping (OD);

Scenario 2 represents the waste treatment in the community composting plant (CCP).





Scenario 1: open dumping

Scenario 2: community composting plant

The functional unit (f.u.) is defined as 1 t of waste entering the treatment facility









# **Results and Discussions: GHG calculation**

	Scenario 1	Scenario 2
1) Feedstock (t/mth)	0	~85
2) Compost produced (t/mth)	0	32
3) GHG calculation		
Total A: total CO <sub>2</sub> generation potential for feedstock treatment	630	177
Total B: total CO <sub>2</sub> generation potential for diesel consumption (kg CO <sub>2</sub> -eq/t material)	1,334.77	1,424.76
Total C: total $CO_2$ saving from the reduction of chemical fertiliser production and carbon sequestration (kg $CO_2$ -eq/t compost)	0	-260.06
4) FINAL	1,964.77	1,341.70

# **Results and Discussion: CBA**

	Scenario 1	Scenario 2	Remark
Capital cost	0	700,000	Site construction, infrastructure, machinery, waste collection bin, chimney system, tilling machine
Operational cost	1038	14150	Labour, process monitoring, farming, fuel cost,, lab analysis, etc
Savings from compost utilisation	0	-339.80	Including fertiliser, pesticide and herbicide
Revenue from membership	0	-27,000.00	MYR 2,000 for 6 mths
FINAL	+ 12,456.00	-54, 277.60	Capital cost normalised for 10 yrs

### Conclusion

- The pilot scale composting facility presented by the organic farm was capable of reducing up to 32% of GHG and able to generate revenue compared to open dumping. Most of the GHG emissions from composting were recorded to be contributed by diesel consumption from transportation and the on-site operation of composting
- The composting-economic model demonstrated by the organic farm can be applied as a successful strategy with the adaptation of membership concept
- Further investigation is needed for better understanding the supply-demand chain of wastes and mature compost to minimise the GHG emission during the process as well as amplify the revenue from running a composting facility.