IE-1

Assessing Heating Value of MSW of Dhaka City to Support WtE Technology

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Objective

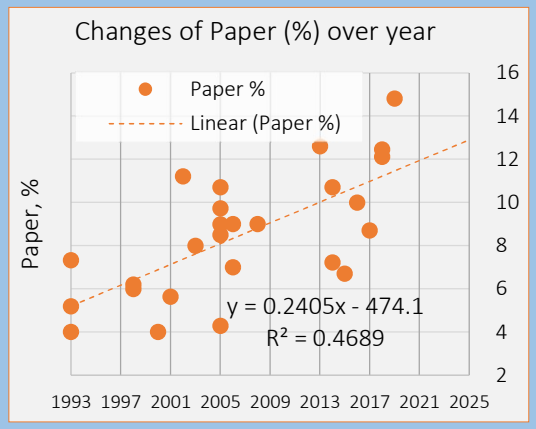
Assessing characteristics MSW of Dhaka to support the feasibility of WtE technology.

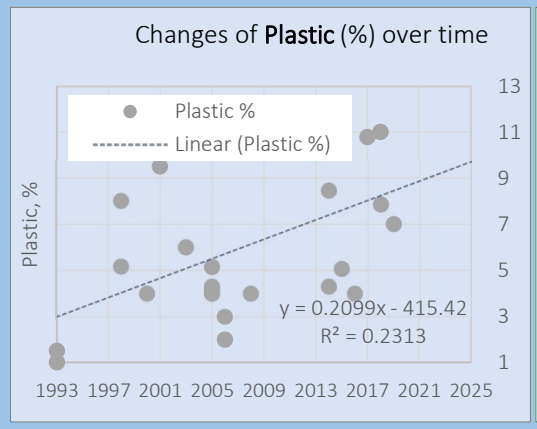
Methodology

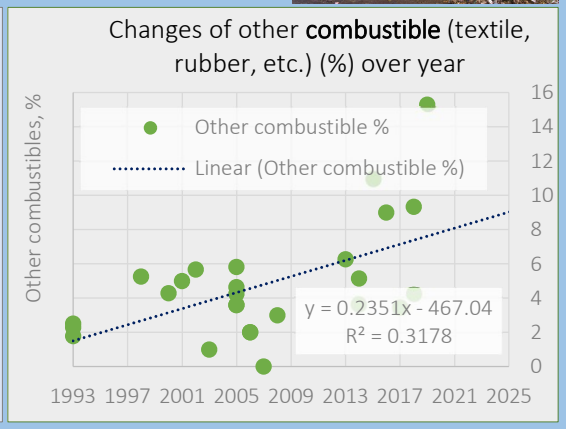
- Characterized data are projected and liner regression equation is drawn based on published and unpublished data.
- Moisture, physical composition, and LHV are calculated for different waste sources. LHV is calculated using three different models: Eq. 1(Chang et al., 2007), Eq. 2 (Drudi et al., 2019) and Eq. 3 (JICA, 2005). The avg. LHV of two models (Eq. 1 & Eq.2) is compared with JICA (2017) & WB (1999).

Conclusion

- Waste from offices can be incinerated as it exhibits suitable LHV (7.86 MJ/kg) for power generation.
- Market, office, and household waste may be targeted for incineration with appropriate pre-treatment for combustibility.
- Hotel & restaurant wastes are suggestive for anaerobic digestion for high moisture content.
- Projection analysis may be improved more with historical data refinement to support future WtE technology in Dhaka city.







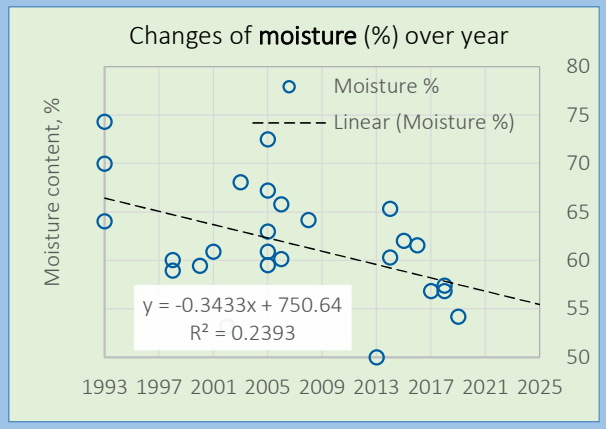


Table 1: Waste quality information based on different sources in Dhaka city (2018-2019)*

Waste Sources	Generation (100%)						Landfill (71%)	
	HH	OFS	STREET	MKT	HOT	Total	LFS-M	LFS-A
Generation, t/d	**4366**	274.4	913.0	924.7	760.9	**7239**	2372	2774
Moisture, %	**62.16**	43.19	37.75	55.10	74.10	61.74**	56.77	56.90
Recyclable, %	24.20	**39.28**	20.44	**42.50**	23.32	26.54	31.09	25.31
Combustible %	26.14	**49.14**	43.46	**43.69**	23.40	29.37**	38.17	33.17

Note. *Analysis is made based on the data taken from JICA, DNCC, DSCC (2018). t/d: ton/day, HH: household, OFS: Office, Street: Street sweeting and construction, MKT: Market, HOT: Hotel &

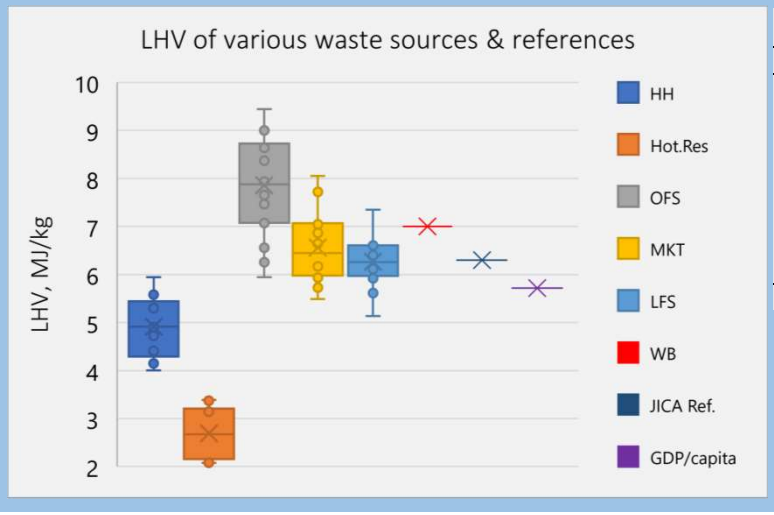


Table 1: Descriptive statistics of calculated LHVs

Statistics	HH	Hot.Res	OFS	MKT	LFS
Mean, LHV ($\bar{x}$), MJ/kg	4.91	2.69	7.86	6.56	6.27
Median, LHV (Md), MJ/kg	4.91	2.67	7.88	6.44	6.26
Standard Error ($\sigma_{\bar{p}}$)	0.14	0.13	0.24	0.16	0.12
Standard Deviation(σ_X)	0.61	0.56	1.01	0.70	0.49
Sample size (n)	18	18	18	18	18
Margin of error (coef. 1.96)	0.28	0.26	0.49	0.32	0.23
Upper bound (M_u), MJ/kg	5.19	2.95	8.32	6.88	6.49
Lower bound (M_l), MJ/kg	4.63	2.43	7.39	6.24	6.04

Note. HH: household, OFS: Office, MKT: Market, Hot.Res: Hotel & Restaurant, LFS: Landfill Site

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