

# SWIM and Horizon 2020 Support Mechanism

Working for a Sustainable Mediterranean, Caring for our Future

## Estimating the Cost of Environmental Degradation in Lebanon (EFH-LB-3)

4-5 February 2019, Beirut, Lebanon

Hosted by



Republic of Lebanon  
Ministry of Environment

This Project is funded by the European Union



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# **ADDITIONAL DAMAGES FROM MUNICIPAL SOLID WASTE**

**LEBANON**

**Cost of environmental degradation due  
to solid waste management practices in  
Beirut and Mount Lebanon  
Final draft**

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## Further items to be included

- **Loss of land value around active land fills**
- **Loss of land value around passive land fills**
- **Health effects (not quantified)**
- **Methane gas recovery**
- **Underground water contamination**

# Loss of land value around transfer stations, processing plants and active landfills

- The land value losses around transfer and processing stations were calculated for Bourg Hammoud (reported as Qarantina and Coral in section 3) and Hbaline separation, recycling and composting plants, and for Amrousieh separation and recycling plant.
- The valuation of land depreciation is based on current lot prices as listed on the website of real estate companies with two concentric circle with the first ring providing a depreciation of 15% and the second ring providing a depreciation of 10%.
- The depreciation value of apartments was not considered due to the lack of data but could have significantly increase the depreciation value associated with this category.
- The same method used for processing plants is used for landfills
- Estimated based on hedonic studies? We don't know.

# Loss of land value around passive landfills

- The same method used for processing plants is used for passive dumps although the land depreciation factors are different.
- The land value depreciation was segmented by dump area where different factors were assigned for dumps smaller than 500 m<sup>2</sup> and larger than 500 m<sup>2</sup>. The land value depreciation associated with the first ring was set at 10% for 20 m and 200 m respectively from the limits of the dump and the second ring at 4% up to 100 m and 1,000 m respectively from the circumference of the 1st ring.
- Don't know where these depreciation numbers come from.

# Methane Emissions Avoidable

- The methane emissions that could be avoided amounts to 23,272 tons in 2012 and 391,767 over 20 years through a better management of the Naameh landfill for the 827,907 tons of waste landfilled in 2012 with a calorific value of decomposing waste of 604,392 tons. NPV discounted at 5% (intergenerational discount rate used for environmental goods and services) CO2 avoided for the period amounted to US\$ 45,470 using the December 2012 rate of certified emission reductions (US\$ 0.198). However, when considering the damage to the global environment based on a US\$ 13.6 per ton of CO2 emitted, the degradation amounted to US\$ 3.1 million in 2012 with a variation between US\$ 2.9 and 3.3 million.
- But if methane is recovered then energy value of methane is a benefit.

# Underground water contamination

- Based on the 2012 waste quantity landfilled and when using the volumetric weight conversion factor, 2% and 10% respectively of leachate seeping in the aquifer is considered which contaminates 50 m<sup>3</sup> of underground water flow/m<sup>3</sup> of leachate. The cost associated are the net costs from treating this highly contaminated water which is almost twice the BML water treatment cost.
- Hence, the cost amounts to US\$ 14.3 million in 2012 with a bracket ranging between US\$ 5.5 and 65.4 million. This cost is also supposed to partially capture other damages notably done to ecosystem services.

**Table 1: BML Cost Assessment of Solid Waste Degradation and Opportunity Loss, 2012, US\$ million**

Typology of Degradation Costs	CASWD		Lower Bound	Upper Bound	Opportunity Loss	
	US\$ million	%	US\$ million	%	US\$ million	%
Collection	0.0	0.0%	0.0	0.0	18.7	25.3%
Discharge	0.0	0.0%	0.0	0.0		
Recycling and composting	0.0	0.0%	0.0	0.0	39.7	53.7%
Landfill area avoidable	0.0	0.0%	0.0	0.0	15.5	21.0%
Underground water contamination from active landfills	14.3	21.6%	5.5	65.4		
Loss of land value around waste processing plants	2.5	3.8%	2.0	3.0		
Loss of land value around active landfills	2.8	4.2%	2.2	3.4		
Loss of land value around passive landfills	0.0	0.0%	0.0	0.0		
Loss of land value in active dumps	0.0	0.0%	0.0	0.0		
Loss of land value in high risk passive dumps	40.9	61.5%	32.7	49.1		
Health effects	NA	0.0%	NA	NA		
Methane emission avoidable	3.1	4.7%	2.9	3.3		
Forgone energy generation	2.8	4.2%	2.6	3.0		
<b>Total</b>	<b>66.5</b>	<b>100.0%</b>	<b>47.9</b>	<b>127.2</b>	<b>73.9</b>	<b>100.0%</b>
<b>% GDP Beirut and Mount Lebanon</b>	<b>0.3%</b>		<b>0.2%</b>	<b>0.6%</b>		<b>0.4%</b>
<b>% GDP Lebanon</b>	<b>0.2%</b>		<b>0.1%</b>	<b>0.3%</b>		<b>0.2%</b>



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# THANK YOU

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