



## FERN Food Establishments Recycling Nutrients

UN ESCWA  
Regional Mapping and Policy Guidelines of  
Green Productive Sectors in the Arab Region

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## FERN facilitates composting and recycling of restaurant waste

Lebanese NGO started operations in November, 2012

Our activities include waste analysis, staff training, waste collection, and cost reduction recommendations

Currently working with 8 restaurants and 1 hotel

Collaborating with the Lebanese Food Bank to donate untouched food to those in need

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## FERN facilitates composting and recycling of restaurant waste

Food waste is composted by Cedar Environmental into organically-certified fertilizer

Other materials like cardboard, plastics, metals, and glass are destined for recycling and reuse

Non-recyclable plastics and styrofoam are used by Cedar Environmental for EcoBoard and other innovative materials

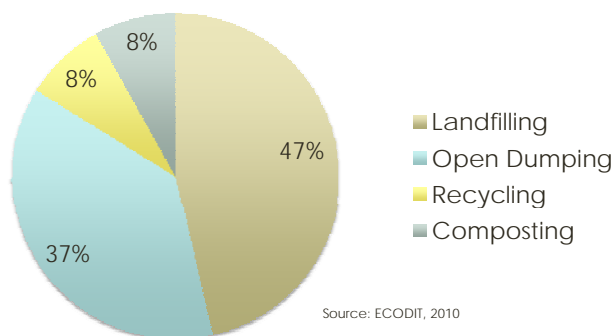
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## The majority of waste in Lebanon is dumped in landfills or into nature

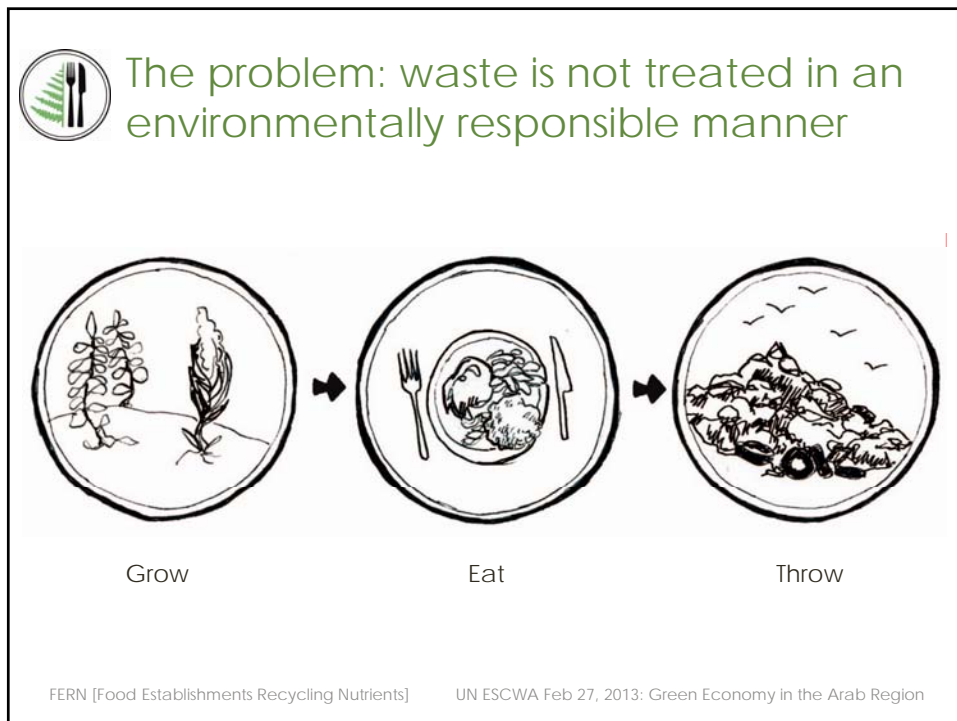
Lebanon Waste Disposal Methods

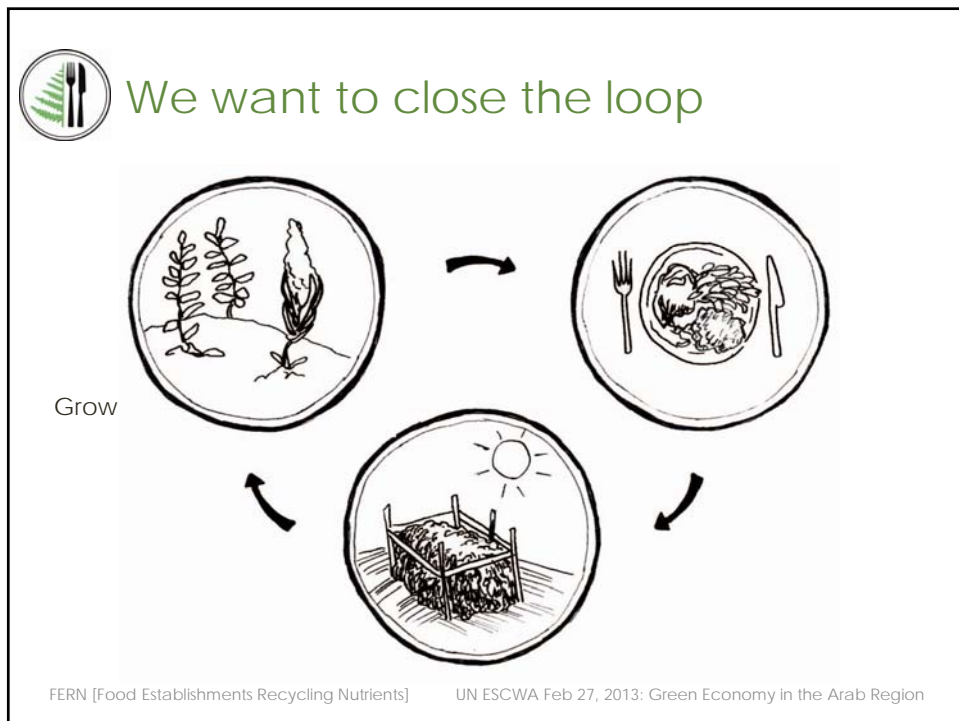
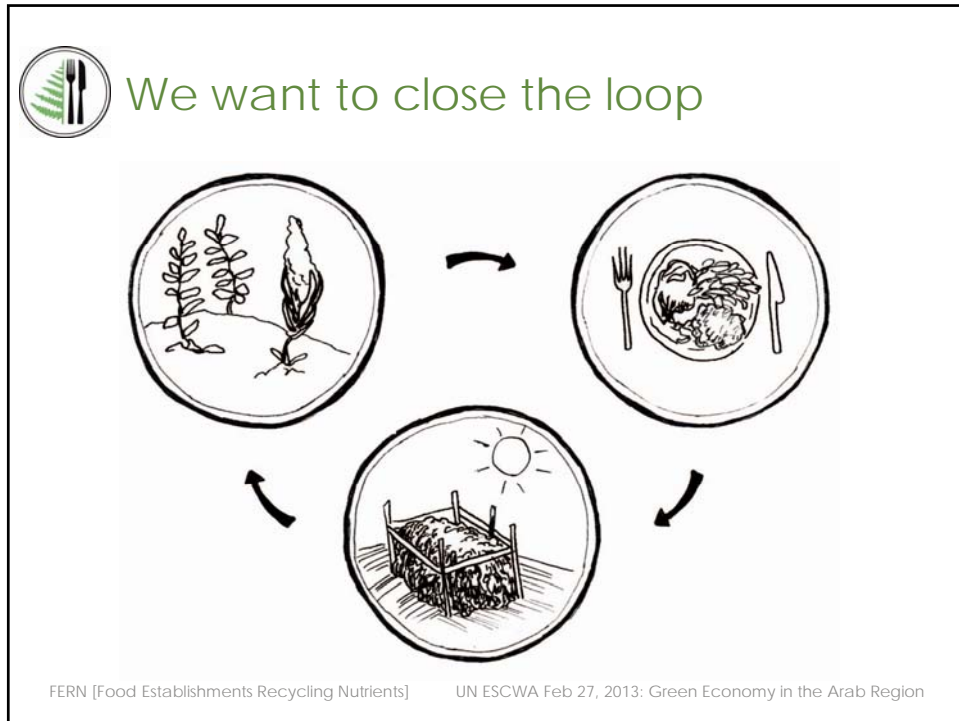


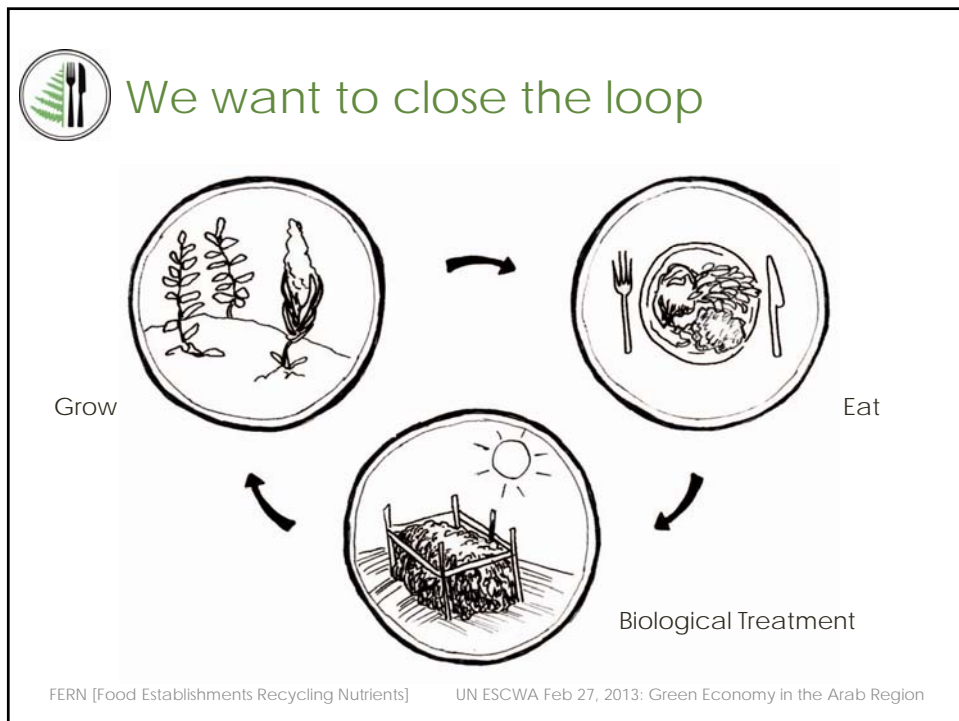
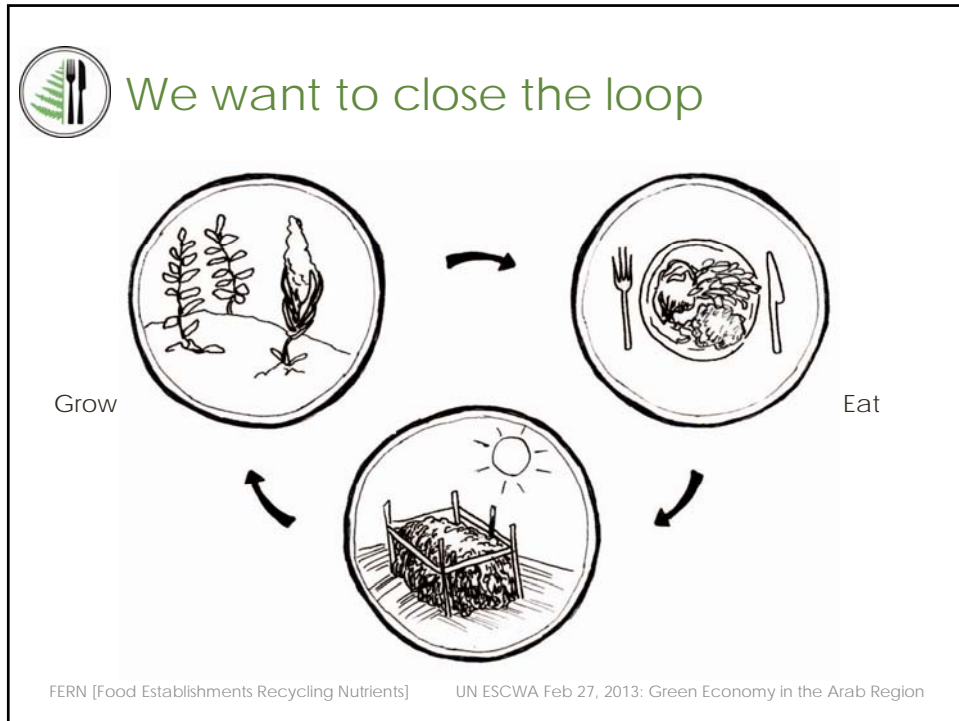
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## In the United States, 75% or more of restaurant waste is organic

Why do we work with restaurants?

- High percentage of recoverable materials
  - > Organic: food waste
  - > Recyclable: plastic, glass, metal
- Small, effective training sessions and staff discussions
- Indirect public engagement
  - > Improves awareness of waste treatment activities
  - > Strengthens advocacy efforts

Source: Macaluso et al., 2003

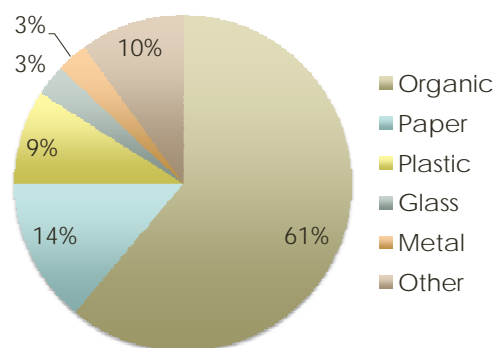
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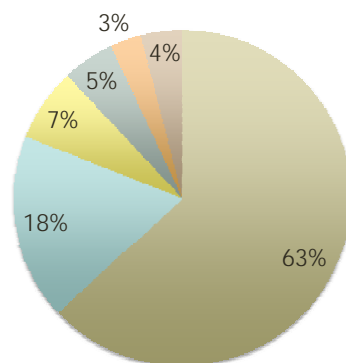


## MENA and Lebanon municipal solid waste composition

MENA Waste Composition



Lebanon Waste Composition



Source: Hoornweg et al., 2012

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## Sorting waste at the source improves the potential for recovery

- Pre-sorted organic waste can be transported directly to treatment facilities
- Less post-collection sorting necessary
- When compacted, the value of materials is reduced
  - Broken glass
  - Plastics covered in decomposing food
  - Decomposing organics

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## Organics separated at the source are a valuable resource

Compost made from pre-sorted organic waste can benefit local agriculture

- Improves nutrient content of soils
- Improves water retention
- Reduces the amount of waste sent to landfill

Compost can be a valuable material for cities

- Landscaping and site remediation
- Urban parks and gardens

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## Landfilling is more expensive than composting

Lebanon will produce approximately 1.6 million metric tons of municipal solid waste this year.

Average Cost of  
Landfilling Per Ton

Activity	USD / ton
Collection	\$25
Sorting	\$26
Baling	\$16
Wrapping	\$13
Landfilling	\$45
<b>Total \$ / ton</b>	<b>\$125</b>

Average Cost of  
Composting Per Ton

Activity	USD / ton
Collection	\$25
Composting	\$30
<b>Total \$ / ton</b>	<b>\$55</b>

Source: SweepNet, 2010

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## FERN Beirut wants to help “sort it out”

- 30+ restaurants in the first 18 months
- Permanent local green job opportunities
- Improve education and recycling in schools
- Close the loop with local farms
- Publish data on restaurant waste generation
  - > Percentage of organics and recyclables
  - > Daily waste generation

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## Feasibility and Opportunities

- Waste analysis
- Cost reduction opportunities
- Industry research – composting, recycling
- Local farming industry research
- Restaurant outreach
- Marketing strategy development
- Waste sorting training
- Waste hauling industry research

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## Thank you and see you at Tawlet for dinner this evening!

FERN is inviting you to enjoy a buffet of authentic Lebanese dishes and traditional juices this evening at Tawlet in Mar Mikhael.

Tawlet is a restaurant run by Souk el Tayeb, a Beirut-based farmers market that supports small agricultural producers from across Lebanon.

FERN and Tawlet have been working to reduce wastefulness since November, 2012.

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Macaluso, L., Desmond, J., & Pac, D. (2003, May). Composting in Restaurants and Schools: a municipal toolkit. Center for Ecological Technology: Northampton.

SweepNet Country Profile on the Solid Waste Management Situation in Lebanon. (2010, July). Retrieved on February 21, 2013, from <http://www.sweep-net.org/ckfinder/userfiles/files/country-profiles/CountryreportLebanon-En-mai2011.pdf>

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## Cedar Environmental Compost: Heavy Metals Content Comparison

American University of Beirut, Environment Core Laboratory  
07/09/2009, Reference Number ECL09907-444

### Heavy Metal Analysis

Analysis	MDL mg/Kg	Compost Sample Result mg/Kg	EU Standards Regular compost mg/Kg	EPA CFR 503.13 Maxi. Allowed Conc. of Pollutant mg/kg	Canadian standard council CAN/BNQ 0413- 200/2005 mg/Kg	EEC No. 2092/91 (Organic Farming) Class A+ Compost Conc. of Pollutant mg/kg
Arsenic (As)	0.02	0.307	NLA	41	13	NLA
Cadmium (Cd)	0.02	1.24	2	39	3	0.7
Chromium (Cr)	0.02	6.82	NLA	NA	210	NA
Copper (Cu)	0.02	22.35	100	NA	400	NA
Molybdenum(Mo)	0.02	0.645	NLA	NA	5	NA
Lead (Pb)	0.02	10.5	150	300	150	45
Mercury (Hg)	0.002	0.34	0.5	17	0.8	0.4
Nickel (Ni)	0.02	4.29	50	420	62	25
Zinc (Zn)	0.02	81	400	2800	700	200
Selenium (Se)	0.02	0.79	25	36	2	NLA

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