STRATEGIC PLAN FOR SOLID WASTE MANAGEMENT IN THE TOWN OF JOUN: A GRANT PROPOSAL

The objective of this project is to establish a comprehensive waste management and recycling system

It is heartwarming to know that Joun is well known to be a clean Town in the Chouf. However, despite commendable initiatives (Waste collection and recycling, and neighborhood cleanup initiatives) that have already been established in the town yet many neighborhoods in Joun are still suffering from waste and litter.

Antoine J. Burkush, PhD

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A Grant Proposal

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Acknowledgments

This collection of proposals is the result of a shared vision and a collaborative journey, guided by the input, dedication, and insights of countless individuals who hold Joun close to their hearts. It would not have been possible without the unwavering support and contributions of community members, experts, stakeholders, and local leaders, each of whom brought their unique perspectives to the table.

First and foremost, I extend my heartfelt gratitude to the residents of Joun, whose voices, ideas, and aspirations have been the foundation of this work. Your willingness to share your thoughts and dreams for our town has been invaluable in shaping proposals that truly reflect our community's spirit and goals. Your participation in discussions, surveys, and community gatherings has been a testament to your commitment **to Joun's future.**

Special thanks to all whose contributions were instrumental in refining our vision.

To the local leaders and stakeholders who championed this project, your support has been a vital source of encouragement. Your leadership and understanding of Joun's unique challenges and opportunities have given depth to these proposals, grounding them in both our town's history and its potential for growth.

Finally, I would like to thank everyone who worked behind the scenes—whether gathering data, conducting research, or organizing meetings—your efforts have been crucial in bringing this work to life.

Together, we have created a roadmap for Joun's future that honors our heritage and inspires a brighter tomorrow. I am truly grateful to each of you for your contributions, enthusiasm, and dedication to this endeavor.

With sincere appreciation,

Dr Antoine J. Burkush, PhD

الشكر والتقدير

هذه المجموعة من المقترحات هي نتيجة رؤية مشتركة ورحلة تعاونية ، تسترشد بمدخلات وتفاني ورؤى عدد لا يحصى من الأفراد الذين يحملون جون قريبا من قلوبهم. لم يكن ذلك ممكنا بدون الدعم والمساهمات الثابتة من أعضاء المجتمع والخبراء وأصحاب المصلحة والقادة المحليين ، الذين قدم كل منهم وجهات نظره الفريدة إلى الطاولة.

أولا وقبل كل شيء، أعرب عن خالص امتناني لسكان جون، الذين كانت أصواتهم وأفكارهم وتطلعاتهم أساس هذا العمل. لقد كان استعدادك لمشاركة أفكارك وأحلامك لمدينتنا لا يقدر بثمن في تشكيل المقترحات التي تعكس حقا روح مجتمعنا وأهدافه. كانت مشاركتك في المناقشات والاستطلاعات والتجمعات المجتمعية شهادة على التزامك بمستقبل جون.

شكر خاص للذين كانت مساهماتهم مفيدة في صقل رؤيتنا.

إلى القادة المحليين وأصحاب المصلحة الذين دافعوا عن هذا المشروع ، كان دعمكم مصدرا حيويا للتشجيع. لقد أعطت قيادتك وفهمك لتحديات وفرص جون الفريدة عمقا لهذه المقترحات ، مما جعلها راسخة في كل من تاريخ مدينتنا وإمكاناتها للنمو.

أخيرا ، أود أن أشكر كل من عمل وراء الكواليس - سواء في جمع البيانات أو إجراء البحوث أو تنظيم الاجتماعات - كانت جهودك حاسمة في إحياء هذا العمل.

معا ، أنشأنا خارطة طريق لمستقبل جون تكرم تراثنا وتلهم غدا أكثر إشراقا. أنا ممتن حقا لكل واحد منكم على مساهماتكم وحماسكم وتفانيكم في هذا المسعى.

مع خالص التقدير،

د. انطوان جان البرخش

مشاريع

مبادرات شخصية

"من أجل الصالح العام"

Joun Development Projects

"Pro Bono Publico"

Dr Antoine J. Burkush, PhD

رؤية واحدة، هوية واحدة، مجتمع واحد

Preface

In a world where rapid change is the new normal, the importance of strategic, sustainable, and community-centered development is paramount. Joun, with its rich cultural heritage, natural beauty, and resilient community, stands at a crossroads—one that presents both challenges and extraordinary opportunities. As we look toward Joun's future, it is essential that our plans honor the town's heritage, respond to today's needs, and set a course for future generations to thrive.

This series of proposals is the result of a deeply collaborative effort to envision Joun's path forward. Each plan reflects input from residents, local stakeholders, and community leaders, resulting in a shared vision that is both ambitious and respectful of our town's unique identity. These proposals encompass a comprehensive range of initiatives, from infrastructure and economic development to cultural preservation and environmental stewardship, with each component tailored to address Joun's specific strengths, challenges, and aspirations.

Our proposals emphasize a commitment to public infrastructure improvements, economic empowerment, environmental sustainability, and cultural continuity. From plans to enhance recreational facilities and community services to initiatives for sustainable tourism and green energy, each proposal aims to make Joun a model of progressive yet grounded development. The ultimate goal is to create a vibrant, inclusive, and resilient community—one that embodies the values, dreams, and talents of its people.

I extend my heartfelt gratitude to everyone who has contributed to this vision. Your dedication, ideas, and insight have been invaluable, illuminating the pathway to a future that aligns with Joun's core values while embracing growth and innovation. These proposals are an invitation to all residents of Joun to imagine, participate, and help build a community that harmonizes tradition with the possibilities of tomorrow.

As you review this collection, I encourage you to see not just plans, but a vision for what Joun can become. Let us move forward together, translating these ideas into action, and creating a brighter, thriving, and unified future for Joun.

With deep respect and optimism,

Dr Antoine J. Burkush, PhD

مقدمة

في عالم حيث التغيير السريع هو الوضع الطبيعي الجديد ، فإن أهمية التنمية الاستراتيجية والمستدامة التي تركز على المجتمع أمر بالغ الأهمية. تقف جون ، بتراثها الثقافي الغني وجمالها الطبيعي ومجتمعها المرن ، على مفترق طرق - مفترق طرق يمثل تحديات وفرصا غير عادية. بينما نتطلع إلى مستقبل جون ، من الضروري أن تكرم خططنا تراث المدينة ، وتستجيب لاحتياجات اليوم ، وتضع مسارا للأجيال القادمة لتزدهر.

هذه السلسلة من المقترحات هي نتيجة جهد تعاوني عميق لتصور مسار جون إلى الأمام. تعكس كل خطة مدخلات من السكان وأصحاب المصلحة المحليين وقادة المجتمع ، مما يؤدي إلى رؤية مشتركة طموحة وتحترم الهوية الفريدة لمدينتنا. تشمل هذه المقترحات مجموعة شاملة من المبادرات ، من البنية التحتية والتنمية الاقتصادية إلى الحفاظ على الثقافة والإشراف البيئي ، مع تصميم كل مكون لمعالجة نقاط القوة والتحديات والتطلعات المحددة لجون.

تؤكد مقترحاتنا على الالتزام بتحسين البنية التحتية العامة ، والتمكين الاقتصادي ، والاستدامة البيئية ، والاستمرارية الثقافية. من خطط تعزيز المرافق الترفيهية والخدمات المجتمعية إلى مبادرات السياحة المستدامة والطاقة الخضراء ، يهدف كل اقتراح إلى جعل جون نموذجا للتنمية التقدمية والمرتكزة. الهدف النهائي هو إنشاء مجتمع نابض بالحياة وشامل ومرن - مجتمع يجسد قيم وأحلام ومواهب شعبه.

وأعرب عن خالص امتناني لكل من ساهم في هذه الرؤية. لقد كان تفانيك وأفكارك ورؤيتك لا تقدر بثمن ، مما يضيء الطريق إلى مستقبل يتماشى مع القيم الأساسية لجون مع احتضان النمو والابتكار. هذه المقترحات هي دعوة لجميع سكان جون للتخيل والمشاركة والمساعدة في بناء مجتمع ينسق التقاليد مع إمكانيات الغد.

أثناء مراجعتك لهذه المجموعة ، أشجعك على رؤية ليس فقط الخطط ، ولكن رؤية لما يمكن أن يصبح عليه جون. دعونا نمضي قدما معا، ونترجم هذه الأفكار إلى أفعال، ونخلق مستقبلا أكثر إشراقا وازدهارا وموحدا لجون.

مع الاحترام العميق والتفاؤل،

د. انطوان جان البرخش

STRATEGIC PLAN FOR SOLID WASTE MANAGEMENT IN THE TOWN OF JOUN:

A Grant Proposal

BACKGROUND

It is heartwarming to know that Joun is well known to be a clean Town in the Chouf. Despite commendable initiatives (Waste collection and recycling, and neighborhood cleanup initiatives) that have already been established in the town yet many neighborhoods in Joun are still suffering from waste and litter.

In addition to the investments in physical recycling structures, the town must concurrently invest in code enforcement and litter prevention to encourage private investment in these communities and provide a clean and safe environment for current residents.

Develop and implement a long-term investment plan to create a sewer, water and power infrastructure in Joun neighborhoods. Utilize camera technology in frequent illegal dumping locations and strategically enforce penalties to consistent violators.

INTRODUCTION

What is Strategic Planning?

Strategic planning is a crucial process through which an organization defines its direction, allocates resources, and sets goals to achieve its desired future. For municipalities, strategic planning involves developing strategies, objectives, and action plans to address current challenges and shape the community's path forward. It serves as a roadmap, guiding decision-making and resource allocation.

In the case of small towns like Joun, strategic planning takes on a unique character due to factors such as close-knit communities, limited resources, and a strong emphasis on quality of life.

Waste Management Planning

Waste management planning refers to the process of determining how to handle and manage different waste streams, including disposal methods, separation of materials, transportation, and storage, while addressing safety and environmental concerns.

A Waste Management Plan is a crucial report that outlines how waste generated within a specific area will be managed.

Here are the key points to consider when developing such a plan:

1. Purpose and Scope:
    - Define the purpose of the plan (e.g., sustainable waste management, environmental protection).
    - Specify the geographic area covered (e.g., a town, municipality).

2. Waste Streams Analysis:
Evaluate various waste streams, including:

- Household trash
- Commercial, institutional, and industrial waste
- Bio solids (sewage treatment plant sludge)
- Construction debris
- Organics (food and yard waste)
- Recyclables
- Non-traditional waste (e.g., liquid waste, greenhouse gas emissions)

3. Benefits of a Waste Management Plan:

- Environmental Protection:
  - Proper waste management protects water and air quality.
  - Recycling and composting reduce reliance on fossil fuels.

- Financial Savings:
  - Selling or donating recyclables saves money.
  - Data-driven planning reduces long-term costs.

- Long-Term Planning:
  - Use actual waste generation data for better planning.
  - Reduce the tax burden on residents.

4. Implementation and Schedule:

- Develop an actionable program with realistic steps.
- Set a timeline for implementing changes.

What is a Waste Management Plan?

A Waste Management Plan is a report that details the likely waste generated for a particular use and how it will be managed once the use is established.

The purpose of a Waste Management Plan is to ensure that waste storage and collection is considered before a use is established, so that there is sufficient space to meet the future requirements.

Components of a Typical Waste Management Plan

There are four main things that need to be included in a Waste Management Plan: assessment, storage, collection and management.

- Waste Assessment: Identifying and categorizing the types and quantities of waste generated.

This includes identifying the different types of waste (waste streams) that will likely be generated as well as the amount of each.

- Waste Storage: Detailing how and where the waste will be stored on-site. Once the types and quantities of waste that will be generated has been calculated, the storage requirements can be determined. This means working out the size and number of different bins required (for each waste stream) and where these bins will be stored. If waste areas are to be shared between different tenancies or units then this should be noted as well and access should be easy for all occupants.

- Waste Collection: Detailing the type, frequency and process for waste collection.
  The first thing to determine is if the waste collection will be by private contractor or Council service. The frequency of the waste collection may be partly determined by the amount of waste that will be generated and the amount of storage for bins that is available. In this section you should also detail how the collection process will be handled. Some questions to consider are: will the bins be moved by occupants to and from a collection area? If so, how will this process be managed, will it need to be a responsibility of a body corporate (if bins are shared)? Will vehicles enter the site to empty the bins? If vehicles will be entering the site then swept path diagrams will likely be required to demonstrate that there is enough space for these trucks to enter and exit safely.

- Waste Management: Detailing any ongoing management processes. Any processes that will require ongoing management to ensure there aren't issues on or off the site should be noted in this section. Things such as regular bin cleaning or managing amenity issues such as noise from glass waste or odors would be discussed with actions to minimize any impacts detailed.

There are also some additional things that may be required for an individual Waste Management Plan:

- Waste Minimization Strategies: Implementing measures to reduce the amount of waste generated.

  Treatment and Disposal Methods: Determining appropriate treatment or disposal methods for special types of waste. If a site could generate other waste types such as E-waste, hard waste or medical waste, these should be noted and the process detailed.

- Education: Providing education or information to employees/residents. For example, there may need to be information provided to all tenants on the process for waste storage and collection in an apartment complex or details of

waste storage practices to minimize external impacts given to all staff of a commercial building. This may be in form of signage or information.

How to Get Help with Preparing a Waste Management Plan

Starting a community-based waste project involves several steps.

Here's a concise guide to help you get started:

1. Assess the Situation:
   - Understand the existing waste management practices in your community.
   - Identify challenges, resources, and potential partners.
2. Raise Awareness:
   - Educate community members about waste issues.
   - Organize workshops, discussions, and awareness campaigns.
3. Community Engagement:
   - Involve residents, local leaders, and organizations.
   - Build a shared vision for waste management.
4. Needs Assessment:
   - Identify specific needs and priorities.
   - Consider waste collection, recycling, composting, and disposal.
5. Plan and Design:
   - Develop a project plan.
   - Consider funding sources, logistics, and sustainability.
6. Implement Small-Scale Initiatives:
   - Start with manageable projects (e.g., community clean-ups, recycling drives).
   - Engage volunteers and collaborate with schools or businesses.
7. Monitor and Evaluate:
   - Track progress and adjust as needed.
   - Measure impact and community participation.

Implementing waste-to-energy (WtE) facilities involves several steps

Implementing waste-to-energy (WtE) facilities involves several steps. Here's a concise guide:

1. Feasibility Study:

- Assess the feasibility of WtE in your area.
- Consider factors like waste composition, energy demand, and available technology.

2. Technology Selection:

- Choose a suitable WtE technology:
  - Incineration: Converts waste into heat and electricity.
  - Anaerobic Digestion: Produces biogas from organic waste.
  - Gasification: Converts waste into synthetic gas (syngas).
  - Plasma Arc Gasification: High-temperature process.
- Evaluate costs, emissions, and efficiency.

3. Site Selection:

- Identify an appropriate location for the facility.
- Consider proximity to waste sources, grid connections, and environmental impact.

4. Permitting and Regulations:

- Obtain necessary permits and comply with regulations.
- Involve local authorities and stakeholders.

5. Design and Construction:

- Engage engineers and architects.
- Design the facility layout, infrastructure, and safety features.
- Construct the WtE plant.

6. Operations and Maintenance:

- Hire skilled staff for operation and maintenance.
- Monitor emissions, energy production, and waste input.

7. Energy Distribution:

- Connect the WtE plant to the grid.

- Distribute electricity generated.

8. Environmental Considerations:

- Address air emissions (e.g., particulates, NOx).

- Manage ash disposal properly.

Waste Management Infrastructure for a Circular Economy

In today's world, waste management is becoming increasingly important, not just for maintaining a clean and healthy environment but also for promoting sustainable development. However, traditional waste management methods are often linear, meaning that they follow a take-make-dispose model, leading to waste accumulation and pollution.

In contrast, a circular economy model aims to eliminate waste by keeping materials and resources in use for as long as possible. This approach is based on the principles of reduce, reuse, and recycle.

A circular economy requires a robust waste management infrastructure that supports the efficient use of resources and promotes sustainable practices. Such an infrastructure should be designed to minimize waste generation and maximize resource recovery. It should also focus on reducing the environmental impact of waste disposal.

To achieve this, waste management infrastructure needs to be designed with a circular economy in mind. This means that it should prioritize the recovery and reuse of materials, rather than simply disposing of them.

This can be achieved through a variety of approaches, including waste reduction at the source, material recovery and recycling, and the use of innovative technologies such as waste-to-energy.

Moreover, the circular economy model emphasizes the importance of collaboration and partnerships. Thus, a successful waste management infrastructure for a circular economy requires the involvement of all stakeholders, including businesses, governments, and individuals.

By working together, it is possible to create a sustainable waste management system that promotes a healthier environment and a more sustainable future for all.

SOLID WASTE MANAGEMENT IN THE TOWN OF JOUN

Steps to Proceed with A Plan for Joun

1. Assess the Need:
   - Understand your community's waste management challenges.
   - Identify specific areas where waste reduction efforts are most needed.
2. Engage the Community:
   - Talk to residents, local leaders, and businesses.
   - Gauge interest and gather support for your project.
3. Educate and Raise Awareness:
   - Organize workshops or awareness campaigns.
   - Highlight the benefits of waste reduction and recycling.
4. Set Up Recycling and Composting Programs:
   - Establish accessible recycling bins in public spaces.
   - Consider composting workshops and collection schemes[24].
5. Collaborate with Local Organizations:
   - Partner with schools, NGOs, or businesses.
   - Leverage their resources and expertise.
6. Start Small and Scale Up:
   - Begin with manageable projects (e.g., neighborhood clean-ups, recycling drives).

- Gradually expand as community involvement grows.

Successful examples of community-based waste projects in Lebanon:

1. ECODIT's DAWERR Activity:

- Description: ECODIT, in collaboration with local partners, is implementing the Diverting Waste by Encouraging Reuse and Recycling (DAWERR) project. This five-year, $15 million initiative aims to establish sustainable and replicable integrated solid waste diversion and valorization solutions in rural areas of Lebanon.

- Partners:

- ECODIT Liban: ECODIT's sister company in Lebanon, which implements environmental projects with development partners.

- Compost Baladi: A social enterprise enabling organic waste recovery and composting.

- Berytech: An NGO supporting startup development.

- Achievements: The project facilitates public-private partnerships (PPPs) and engages young entrepreneurs to contribute fresh perspectives to waste management[1].

2. Lebanese Organization for Studies and Training (LOST):

- Description: LOST, founded in 1985, has spearheaded recycling efforts in Lebanon. It has launched programs to recycle various materials, including medical waste and clothes. LOST also played a role in developing Lebanon's first waste management law[2].

3. Zero Waste Community:

- Description: Nibal Daouq's Zero Waste Community focuses on waste management, sustainability, and green citizenship. Through initiatives like recycling plants, they transform Lebanon's garbage crisis into an opportunity for positive change[3].

Lebanese waste management projects encounter several challenges:

1. Political Instability:

- Lebanon's political situation affects policy implementation and stability.

- Changes in government can disrupt waste management plans.

2. Financial Constraints:

- Funding limitations hinder project scalability.

- Grants and donations may not cover all needs.

3. Infrastructure Deficits:

- Aging infrastructure struggles to handle waste.

- Lack of proper facilities affects waste collection and disposal.

4. Public Awareness and Participation:

- Raising awareness about waste reduction is challenging.

- Engaging the public in sustainable practices requires continuous effort.

5. Waste Crisis Legacy:

- Lebanon's 2015-2016 garbage crisis left a legacy of mistrust.

- Convincing communities to embrace new waste management approaches is difficult.

ECOSERV

ECOSERV is an organization with multiple facets, so let's explore them:

1. Ecoserv for Oilfield Waste Management & Cleaning Services:

- Ecoserv provides industrial cleaning services and waste management solutions in the exploration and production field of the oil and gas industry. Their services range from offshore to underground, ensuring safe and environmentally friendly waste disposal[3].

- They specialize in specialized cleaning for platforms, tanks, and vessels, aiming to eliminate workers' exposure to hazardous environments[3].

2. Ecoserv's Environmental Initiatives:

- Ecoservlb is a branch of Ecoserv that partners with environmental and humanitarian NGOs, as well as private organizations. Their mission is to create a self-sufficient eco-system focused on environmental preservation and human dignity[2].

- They work on projects related to preserving the environment, which aligns with your interest in community development and cultural heritage preservation.

3. Ecoserv's Sustainable Approach:

- Ecoserv diverts workplace waste from landfills, emphasizing reuse and value delivery to customers and the community. Their award-winning program ensures that commercial furniture and assets remain in circulation through reuse[4].

Ecoserv's environmental initiatives

Ecoserv's environmental initiatives focus on preserving the environment and promoting human dignity. Here are some key aspects:

1. Ecoservlb:

- Ecoservlb is a branch of Ecoserv that collaborates with environmental NGOs, humanitarian organizations, and private entities.

- Their mission is to create a self-sufficient eco-system that balances environmental preservation with human well-being.

2. Projects:

- Ecoservlb works on various projects related to sustainability and community development.

- These projects may include cultural heritage preservation, green spaces, and eco-friendly practices.

3. Holistic Approach:

- Ecoservlb emphasizes a holistic approach that considers both environmental and social factors.

- They aim to create positive impact by integrating sustainable practices into local communities.

Ecoservlb Partners

Ecoservlb actively collaborates with various partners to promote environmental practices and sustainable development in Lebanon. Here are some notable collaborations:

1. Operational Cooperation with the Circular Hub:

- Ecoservlb partners with the Circular Hub, an initiative focused on circular economy principles.

- Together, they work towards sustainable solutions and community development[4].

2. The Chase Project:

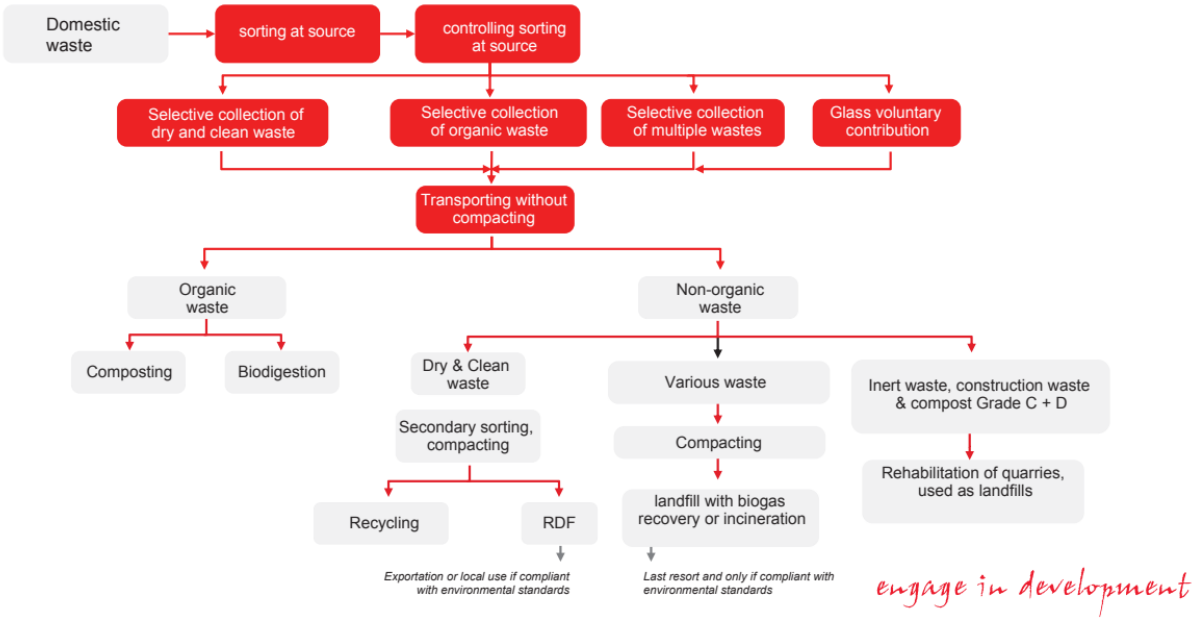
- Ecoservlb collaborated with The Chase, a design agency, on innovative corporate branding and print design.

- This project received national and international awards, showcasing their commitment to creativity and sustainability.

ARCENCIEL Recommendations

Waste management:

This flow chart summarizes the main steps of the waste management process, according to the solution elaborated by arcenciel



The waste incineration: a big threat...

Over 50% of wastes in Lebanon are organic, with a low calorific value. Incineration of this type of waste will consume a lot of energy

80% of waste can currently be recovered without incineration

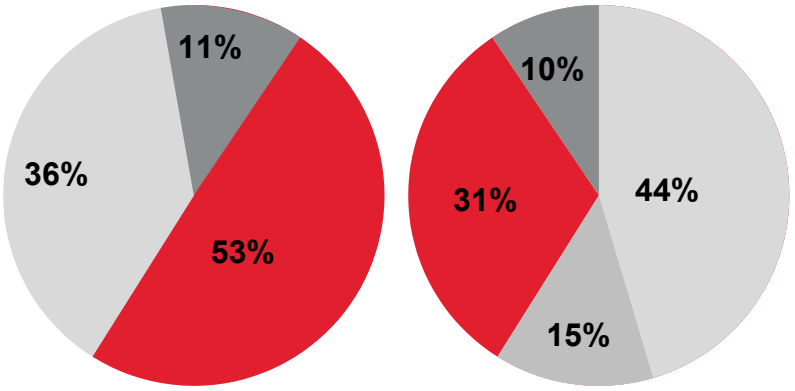
Incinerators emit hazardous & toxic emissions (NO, NO2, SO2, HCl, dioxins...)

Incineration generates hazardous residues to be buried in special landfills that do not exist in Lebanon

Even countries with efficient and well controlled incinerators like Austria tax severely the incineration method, encouraging recycling

The adoption of incineration would result in the extinction of the recycling sector in Lebanon which constitutes a green sector important to the economy and that creates jobs opportunities

Waste composition



29%

in uncontrolled landfills

23%

Only are recycled or composted

48%

in sanitary landfills

80% can currently be recycled, composted or bio digested and exploited, generating economic opportunities while preserving the environment

The current situation is not sustainable

- Limited landfill lifespan
- Limited natural resources
- Important flow of greenhouse gases

1. Waste production

Generation Rate per Capita	
Domestic production (weighted average)	1.05 Kg/day/person
Average in urban areas	0.95-1.2 Kg/day/person
Average in rural areas	0.8 Kg/day/person

Source : Country report on the solid waste management in Lebanon, Sweepnet, April 2014

Roles & responsibilities

THE ROLE OF THE MUNICIPALITY & ITS AGENT

- Ensure awareness with outsourcing option
- Ensure cleaning the streets with outsourcing option
- Ensure a budget for the sorting bins
- Ensure waste collection
- Gather into service zones or clusters of 10,000 to 100,000 inhabitants, to increase the economic efficiency of the waste management process
- Ensure waste management centers:
  - Secondary sorting unit for dry and clean waste
  - Composting unit for organic waste
  - Landfilling site / rehabilitation of quarries
- Outsource the treatment to an operator and monitor its work
- Assign a municipal officer for monitoring the process:
- Check the quality management of the process & the sorting & determination of bins optimal locations
- Check the capacity of bins and collection frequency
- Coordinate with operators for collection and treatment operations
- Control the waste weighing by the waste management operators
- The role of the service provider
- Ensure treatment centers in accordance with arcenciel standards & hopefully government standards
- Ensure waste management services in accordance with arcenciel's standards & hopefully government's standards

The components of waste management

AWARENESS

STANDARDS	Involvement of the municipality's leaders (politicians and religious figures)
	Training of trainers
	Training of ambassadors by trainers (concierge, etc.)
	Awareness (posters, sorting guide, door to door)
RATIOS	Approximately 12 trainers for 50,000 inhabitants
	About 1 ambassador for 20 families
BUDGET (US$)	0.53 - 1 USD/inhabitant/year (including training of the trainers, public awareness, sorting guide + distribution of flyers)
TOOLS	Sorting guide

	Posters / flyers
	Power point presentations
	The animated movie Sodak the Champion
	The anti-waste kit

SORTING AT SOURCE

<table>
<tr><td>TANDARDS</td><td colspan="3">Sorting in 3 categories
• Organic (food scraps, pizza boxes): black bin
• Dry and clean (packaging, paper, metal, cardboard and plastic): blue bin
• Other (diapers, toilet paper, sanitary napkins): red bin</td></tr>
<tr><td></td><td colspan="3">Glass can be but in specific bins (voluntary waste drop-off receptacles)
Hazardous waste (ex. batteries, computers, compact fluorescent lamps) can be dropped in recovery centers (voluntary waste drop-off)</td></tr>
<tr><td></td><td colspan="3">Visual inspection of the sorting quality by the collection operator</td></tr>
<tr><td>RATIOS</td><td colspan="3">For a 20 apartments building:
• 2 bins for dry and clean waste (240L)
• 1 bin for other wastes (240L)
• 1 bin for organic waste (240L)</td></tr>
<tr><td></td><td colspan="3">Every 300 m2:
• 1 bin for passers-by (60L)
• 1 bin for glass voluntary waste drop-off receptacle (1100L if vehicles include a loading system)
• Every 50,000 to 100,000: 1 recovery center
(Social shop / 2nd hand market / recycling of electronic waste)</td></tr>
<tr><td>INVESTMENT COST (US$)</td><td>60,600 $</td><td>OPERATIONAL COST PER YEAR (US$)</td><td>34,542 $</td></tr>
<tr><td>TOOLS</td><td colspan="3">Plastic bins of 240 L with awareness message</td></tr>
<tr><td></td><td colspan="3">Metal or plastic bins of 1100 L</td></tr>
<tr><td></td><td colspan="3">Intelligent bins with sensors as an option</td></tr>
<tr><td></td><td colspan="3">Bins for organic waste with drawer recovery of leachate & an aeration system as an option</td></tr>
<tr><td></td><td colspan="3">Developing incentives for sorting (financial or others, such as non-collection of unsorted waste)
with the municipality</td></tr>
</table>

COLLECTION WITHOUT COMPACTION

STANDARDS	Selective collection in different closed vehicles from each building		
	Collection without compaction with closed vehicles		
	3 tons vehicle for narrow streets preferably with loading system		
	10 tons vehicle for large streets preferably with loading system		
	Daily collection of organic and twice weekly for other waste		
	The vehicle for organic waste should be equipped with a leachate collection system		
RATIOS	1 vehicle 3 T = 1.25 T of non-organic waste per collection		
	1 vehicle 10 T = 3.75 T of non-organic waste per collection		
	1 vehicle 3T = 4.55 T of organic waste per collection		
	1 vehicle 10T = 13.65 T of organic waste per collection		
	1 vehicle with drain system = 1 driver+ 1 assistant driver		
	1 vehicle without drain system = 2 assistant drivers per vehicle		
INVESTMENT COST (US$)	412,500 $	OPERATIONAL COST PER YEAR (US$)	634,323 $
TOOLS	Possibility of using a GPS system for the vehicle		

SECONDARY SORTING OF NON-ORGANIC WASTE

- Recycling and RDF

<table>
<tr><td>STANDARDS</td><td colspan="3">Development of a secondary sorting unit including one reception zone, one sorting conveyor
line and one bailer / compactor to press waste</td></tr>
<tr><td></td><td colspan="3">Monitoring of waste weighting and waste sorting for the billing</td></tr>
<tr><td></td><td colspan="3">If there are excessive sorting errors, take photos and return the waste to the municipality</td></tr>
<tr><td></td><td colspan="3">Secondary sorting of recyclable waste and non-recyclable waste</td></tr>
<tr><td></td><td colspan="3">Compacting secondary sorted dry & recyclable waste & transportation :
• To the recycling centers (for recyclable waste)
• To the producers of RDF (if not recyclable & usable as RDF)
• To landfills / quarries (if not recyclable & not usable in RDF)</td></tr>
<tr><td>RATIOS</td><td colspan="3">Floor area of the sorting center: 1400 m2 for 16T / day (over 40 T of total waste)</td></tr>
<tr><td></td><td colspan="3">Capacity of the sorting line: 2 T / hour</td></tr>
<tr><td></td><td colspan="3">Compactor capacity: 2 T / hour</td></tr>
<tr><td></td><td colspan="3">10 workers for sorting and compacting of 16 T / day (over 40 T of total waste)</td></tr>
<tr><td>INVESTMENT COST (US$)</td><td>including • Construction of the center about 180,000 USD
267,000 $ • A conveyor (2T / hour) = about 12,000 USD
• A compactor (2T / hour) = about 12,000 USD</td><td>OPERATIONAL COST PER YEAR (US$)</td><td>98,439 $</td></tr>
<tr><td>TOOLS</td><td colspan="3">List of recycling plants</td></tr>
</table>

COMPOSTING

<table>
<tr><td rowspan="7">STANDARDS</td><td colspan="3">Development of a composting center built on a concrete floor with 2% slope :
• windrow (if the center is more than 500 meters far from houses)
• tunnel with controlled ventilation & air treatment & suction with biofilters (peat ...) & activated carbon (if the center is located 200 to 500m far from houses)</td></tr>
<tr><td colspan="3">If excessive sorting errors, take photos and return the waste to the municipality</td></tr>
<tr><td colspan="3">Composting of 1 volume of biowaste with 4 green waste volumes</td></tr>
<tr><td colspan="3">6 weeks of fermentation and 2 months of maturation</td></tr>
<tr><td colspan="3">Secondary sorting after completing the maturation cycle Leachate treatment (from the composting and collection vehicles) (Biological treatment followed by treatment by phyto epuration)</td></tr>
<tr><td colspan="3">Tests on each batch of compost</td></tr>
<tr><td colspan="3">Possibility of vermicomposting at home</td></tr>
<tr><td rowspan="2">RATIOS</td><td colspan="3">Floor area of the composting center: 3,500 m2 for 24T / organic waste per day (over 40 T of total waste)</td></tr>
<tr><td colspan="3">4 workers for composting for 24 T / day</td></tr>
<tr><td>INVESTMENT COST (US$)</td><td>169,149 $</td><td>OPERATIONAL COST PER YEAR (US$)</td><td>89,127 $</td></tr>
<tr><td>TOOLS</td><td colspan="3">Guide for composting</td></tr>
</table>

LANDFILLING

STANDARDS	Landfilling in controlled sites in compliance with safety & environment protection standards, with biogas recovery		
	Sites should be provided with an active isolation (geomembrane liner) & a passive isolation (clay)		
	Leachate treatment systems		
RATIO	15,000 m2 for 15 tons / day for 15 years		
INVESTMENT COST (US$)	1,000,000 $	OPERATIONAL COST (US$)	25$/ton
TOOLS	Consultants contact list		

Recommendations

To reduce the quantities of waste to be eliminated:

- Promote sorting at source immediately, collect recyclable waste separately or ask the inhabitants to gather it at a collection point, store them and send them to recycle plants or give them to organizations such as Terre Liban, l'Ecoute & arcenciel
- Promote composting in gardens and vermi-composting on balconies as much as possible. In the villages, give the organic waste to feed chickens, rabbits, etc.
- Educate people on waste reduction (to avoid food waste, avoid surplus ...)

SOME SUGGESTIONS AT A POLITICAL LEVEL

- Liberalize the waste management market: promote decentralization by leaving the choice of subcontracting to municipalities and allow them to select the service operator
- Standardize the sector: specific permits are granted to operators involved in the waste management sector, depending on the
- compliance of their activities to pre-established standards
- Adopt weight-based billing
- Based on the weighing completed at the waste management centers & landfills, and this is to encourage municipalities to minimize their waste & reduce landfilling

CRISIS EXIT PLAN

- Regaining trust
- Adopt a positive attitude
- Create a steering committee, even informal
- Cancel the decision 1/2015
- Suggest a definitive national strategy, and confirmed by legal texts, based on: • Waste sorting and recovery
- Market liberalization

DECENTRALIZATION INCLUDING A TYPOLOGY OF WASTE AND TREATMENT TECHNIQUES

- This strategy should necessarily tend to 0 landfill and 0 incineration Energy recovery should be limited to biogas and RDF
- Ensure legislative and legal security to future actors and investors
- Create a background for launching social enterprises
- Open the market by dividing the sector in different markets
- Accredit operators / municipalities according to predetermined standards and establish monitoring and enforcement systems
- Provide municipalities with training and technical-financial support for waste management and PPP
- Give municipalities the control of their budget and transfer to the independent fund municipal revenue collection on bills of mobile telephony under the VAT
- Partnering in clusters or zones of service 10.000 to100.000 inhabitants
- Gather awareness and training the population

FISCAL, FINANCE AND ECONOMICAL STEERING INSTRUMENTS

Financing of waste management (treatment and collection) is currently achieved through specific mechanisms:

- The Council for Development and reconstruction may allocate budget directly from the government through the treasury of the MoF to cover the construction of solid waste treatment plants (sorting or composting plants).
- The MoIM then deducts these costs from the amount owed by the Municipal Fund to the various municipalities and union of municipalities:
    - The government through the Council for Development and reconstruction may allocate budget directly from the Municipal Fund which was established under the supervision of the MoIM (e.g., operation of SW facilities and landfills in greater Beirut area);
    - International loans and grants (e.g., construction of SWM plants funded by SWEMP, USAID, as well as by the EU through the OMSAR);
    - Proper financing by the municipalities for the operation of some treatment plants and sanitary landfills outside Mount Lebanon (e.g., operation of Zahleh sanitary landfill), through local taxes and the Independent Municipal Fund.

The purpose of the Independent Municipal Fund (IMF) is to give municipalities a share of 10 % of all the bills collected by the central government through Electricité du Liban, the water authorities and different taxes collected by the National authorities. The municipalities have the right to collect only taxes for cleaning and sweeping as part of the property taxes, but the collection of this tax is not effective especially in rural areas.

It is acknowledged that the collection rate of property taxes in Lebanon is deficient.

- The country's existing charge and tax systems are severely limited by low collection rates, which have a profound impact on the MSW sector (the WB-METAP, Feb. 2004).
- Explicit fees and costs recovery system for SWM do not exist in Lebanon. Lebanon suffers from major budget deficits in this sector.

Costs to government of waste management vary greatly in Lebanon.

It is clear that the collection and disposal costs depend very much on the organization of the different management activities.

- In greater Beirut and Mount Lebanon (excluding Jbeil), the cost per ton for collection, transport, treatment and disposal of municipal waste is estimated at around US$ 175 / ton of which about US$ 30/ton is related to collection and transport. In 2010, CDR is currently paying around 130 million US$/year (including waste collection and treatment, as well as street sweeping in greater Beirut area) from the Independent municipal fund.
- Outside the greater Beirut and Mount Lebanon area, waste management costs (collection and disposal) are substantially lower. They are around US$ 45-50 / ton in Zahleh and Tripoli, and around US$ 20-30/ ton in some rural areas with disposal in open dumps. These overall costs (US$/ton) are summarized hereafter:

table 4: Cost of SWM per ton

	Greater Beirut and Mount Lebanon (excluding Jbeil)	Zahleh	Tripoli	Other rural areas	Small units
Collection	25 [1]	17	18[5]	10-18	5
Sorting	26	10	-	-	-
Bailing	16	-	-	-	-
Wrapping	13	-	-	-	-
Landfilling	52 (from 0 to 400,000 ton/year) 38 (from 400,001 to 500,000 ton/year) 45 (> 500,001 ton/year)	5[3] [4]	29		
Composting	30 [2]	-			
TOTAL	130				
			-		
			-		
			-	-	33[6]

(1) Cost excluding sweeping; sweeping: 16,000,000 USD/year
(2) Including hauling from sorting facilities to composting plants
(3) This figure constitutes the operational cost. For full cost recovery, the cost would be 15-20 $/ton (Municipality of Zahle)
(4) The tipping fee being currently paid by the other 18 surrounding municipalities transporting the waste to Zahleh landfill is around 10 $ / ton (partial cost recovery only).It is to be noted that the remaining 17 municipalities are disposing of their waste in a haphazard manner due to shortage of money and the lack of a law enforcing disposal into sanitary landfills
(5) Including sweeping; collection and sweeping: 2,300,000 $/year (i.e. around 18$/ton based on 350 tons/day)
(6) On a Build-Own-Operate (BOO) basis

Case Study: Integrated Solid Waste Management in Zahleh Project:

The project consists of collecting about 180 tons of municipal waste from some municipalities in the district of Zahleh, sorting the waste to remove the recyclable materials, landfilling the refuse in the adjacent sanitary landfill.

The gas coming out from the landfill is being flared and the leachate is collected and treated. The collection and treatment of wastes is contracted to the private sector at competitive prices (for details of prices, refer to other sections of the report).

The implementation of the landfill site in Zahleh has been successful through a process that included public awareness, consultation and participation, but also the strong support of the local politicians and authorities.

Lessons learned:

- Municipalities can have a success story in SWM independently from the government;
- Viability of any SWM project necessitates the commitment and support at both the national and local levels;
- Collection could preferably be the responsibility of the municipalities (while encouraging contracting with the private sector);
- Low cost per ton of sorting and landfilling as compared to other areas in Lebanon, due to proper competitive contracts with the private sector;
- Make use of all the funds and loans provided to the municipalities from various donors like the EU, USAID, YMCA, World Bank, etc., in an orderly manner compatible with the local needs and priorities.

Recommendations:

• Allow the municipalities, such as Zahleh, to create a cost recovery system to be able to pay all the operation, maintenance and construction costs in the future;

• Ensure political and municipal commitment for SWM projects;

• Possibility of adopting similar project schemes for other municipalities or unions of municipalities;

• give such municipalities financial and legal incentives to start awareness campaigns on sorting at the source first and then composting, since the project is in the amidst agricultural lands.

Composting:

Small community based composting plants were built in selected municipalities throughout Lebanon, particularly in the south.

They were funded by the Non-Governmental Agencies (NGOs) Young Men's Christian Association (YMCA), Pontifical Mission (PM) and Creative Associates International Inc. (CAII) with the aid of finance from United States Agency for International Development (USAID).

The execution of the plants has been undertaken by the private sector.

The operation of the majority of the plants is carried out by the municipalities themselves.

Lessons learned:

- Some of the plants suffer considerable operational problems which are due to technical failure in the systems, or to financial, institutional and/or legislative barriers;
- The absence of sorting at the source as well as proper sorting and refining units at the plant is a major obstacle for the production of good quality compost and hence its marketability;
- Some of the municipalities do not have the technical capacity for the proper operation of the plant;
- The small scale of the plants would not allow to develop economies of scale that would reduce overall costs and would also focus available technical expertise on fewer facilities for which higher levels of performance would be feasible;
- The rushed planning of the aids implementation for some of the plants is one of the problem.

Recommendations:

- Support of specific campaigns for promoting sorting of wastes at the source in the household, in a pilot village which already disposes of a composting treatment plant, hence clearly illustrating the correlation between sorting at the source and the improvement of the SWM in general and compost quality in particular;
- Assist in marketing of compost;
- Encourage contracting operation to private sector;
- Better planning of bilateral arrangements and aids, in order to ensure that the SWM technologies and projects are in line with the applied priorities and strategies as well as the local conditions, in the aim of ensuring a better effectiveness of these aids.

Technical Assistance Partners and Donors

A wide range of international organizations and donors are participating in the sector in the country. A number of projects address different approaches for recovering value from waste, and some address aspects of hazardous waste management relevant to the SWM sector.

The activities and projects are mainly focused on the following sectors:

- Feasibility studies for SWM projects, dumpsites rehabilitation, marketing of compost, etc.;
- Development of national strategies and legal/institutional framework for SWM;
- Provision of infrastructure for solid waste collection;
- Closure of existing dumps;
- Execution of SW treatment facilities (sanitary landfills, sorting and composting plants, biogas collection and treatment systems, etc.);
- Strengthening and developing the capacity of stakeholders at the national levels, such as the MOE as well as at the local level such as municipalities;
- Awareness programs to population (such as to encourage local inhabitants to implement sorting at the source).

Description of a Basic Materials Recovery Facility (MRF)

In a Materials Recovery Facility (MRF), waste enters through collection trucks and is dumped onto the tipping floor. From there, materials are scooped up and placed onto conveyor belts, which transport them to the pre-sorting area. Human workers remove items that are not recyclable, sending them either to a landfill or an incinerator[2].

A typical Material Recovery Facility (MRF) consists of four main components:

1. Sorting: This step involves separating recyclable materials from the mixed waste stream. Workers and automated equipment sort materials based on type (e.g., paper, plastic, glass) and quality.

2. Processing: Once sorted, materials undergo further processing. This may include cleaning, shredding, or compacting to prepare them for market.

3. Storage: MRFs store the sorted and processed materials until they are ready for sale to recycling markets. Proper storage ensures material quality and prevents contamination.

4. Load-Out: Finally, the materials are loaded onto trucks or other transport vehicles for delivery to manufacturers who will use them to create new products[2].

Location Considerations for a recycling Center:

Selecting the right location for a recycling center involves several considerations.

Let's explore some key factors:

ZONING AND REGULATIONS:

- Ensure the chosen site complies with zoning requirements for waste facilities.

- Verify any environmental regulations related to waste management.

COMMUNITY ACCEPTANCE:

- Engage with the local community. Seek their input and address concerns.

- A well-informed and supportive community can enhance the success of the recycling center.

ENVIRONMENTAL IMPACT:

- Assess potential impacts on air quality, water resources, and nearby ecosystems.

- Avoid sensitive areas (e.g., wetlands, wildlife habitats).

Potential negative impacts of recycling and composting:

1. COMPOSTING:

- Odor and Pests: Composting can attract unwanted pests and wildlife, creating public health risks and property damage. Improperly managed compost piles may emit strong odors, which can be problematic for nearby residents and businesses[2].

- Pathogens and Nutrient Levels: Challenges in composting include pathogen detection, low nutrient status, long composting duration, and odor production. These factors have led some to consider chemical fertilizers as an alternative to compost over time[4].

2. RECYCLING:

- Energy and Resources: Recycling processes consume energy and resources. For example, transporting recyclables to processing facilities and converting them into new products requires energy and water.

- Contamination: Contaminated recyclables (e.g., mixing non-recyclable materials with recyclables) can reduce the effectiveness of recycling efforts.

- Limited Material Types: Recycling is not suitable for all waste types. Some materials, such as certain plastics, are challenging to recycle effectively.

- Economic Costs: Establishing and maintaining recycling infrastructure can be costly for municipalities and businesses.

Impact on Land Value:

The impact of a recycling center on land value can vary based on several factors. Let's explore some considerations:

1. Perceptions and Environmental Assessment:

- A study in Buenos Aires City assessed a municipal Recycling Centre. Residents' perceptions were negative due to litter around waste containers, dust emissions, and

heavy truck traffic. However, positive perceptions were linked to awareness of the Centre's role in recycling and employment[1].

- Takeaway: Negative perceptions can affect the desirability of nearby properties.

2. Hazards and Odor:

- Landfills and recycling centers can bring hazards such as odor, smoke, noise, bugs, and water supply contamination[2].

- Takeaway: These factors may reduce land values in the vicinity.

Plastic recycling:

Plastic recycling, while often seen as environmentally friendly, can have significant health impacts on workers and nearby residents.

Here are some key points:

1. Toxic Chemical Exposure:

- Plastic recycling involves sorting, shredding, and melting plastic. During these processes, harmful chemicals are released into the air.

- Workers and residents near recycling facilities can inhale toxic dust or fumes, risking serious health conditions, including cancer and reproductive harm[1].

2. Air Pollution Risks:

- Localized air pollution from plastic recycling poses risks to human health.

- The release of toxins during shredding and melting can lead to respiratory diseases and long-term health problems[1].

Zoning requirements for recycling facilities:

Zoning requirements for recycling facilities vary by location and are typically determined by local governments.

Here are some general considerations:

1. Land Use Permits:

- All recycling facilities require land use permits from the host city or county.

- These permits ensure compliance with zoning regulations and environmental protection[2].

2. Zoning Districts:

- The suitability of a location depends on the zoning district.

- Small collection facilities may be permitted in commercial or designated convenience zones.

- Heavy processing facilities are usually allowed in industrial zoning districts with conditional use permits[3].

3. Environmental Impact:

- In California for example recycling facilities must comply with environmental regulations, such as the California Environmental Quality Act (CEQA).

- CEQA ensures that environmental impacts are assessed and mitigated[2].

FUNDING STRATEGIES FOR PROJECTS IN JOUN

Funding for community-based waste projects

Funding for community-based waste projects can come from various sources. Here are some options:

1. Solid Waste Infrastructure for Recycling Grants for Communities:

- Eligible Applicants: Political subdivisions of states and territories (counties, cities, towns, parishes, etc.).

- Purpose: These grants support projects that:

- Implement circular economy strategies.

- Improve local post-consumer materials management programs, including municipal recycling.

- Enhance local waste management systems.

- Funding: Authorized under the Save Our Seas 2.0 Act, with a total of $275 million available from Fiscal Year 2022 to Fiscal Year 2026[1].

2. Community Development Block Grants (CDBG):

- Eligible Recipients: Local governments and community-based organizations.

- Purpose: CDBG funds can be used for various community development activities, including waste management projects.

- Application Process: Apply through your local government or regional planning agency.

3. Environmental Justice Collaborative Problem Solving Program:

- Eligible Recipients: Community-based organizations.

- Grant Amounts: Between $150,000 and $500,000.

- Purpose: Address environmental justice issues, including waste management, in underserved communities[4].

4. Private Foundations and NGOs:

- Many private foundations and non-governmental organizations (NGOs) provide grants for environmental and community projects.

- Research foundations aligned with waste management and sustainability.

5. Local Fundraising and Donations:

- Engage the community through fundraising events, crowdfunding campaigns, and donations.

- Collaborate with local businesses and individuals who share your vision.

Combining multiple funding sources can strengthen your project's financial sustainability.

Funding for community projects in Joun can come from various sources.

Here are some strategies to consider:

1. GRANTS AND SUBSIDIES:

- National, regional, and International grants that support initiatives related to sustainability, urban development, and community well-being. Many agencies, foundations, and nonprofit organizations offer grants for specific project types.

- Grants specifically designed for eco-friendly initiatives, national historic preservation, and community development.

2. PUBLIC-PRIVATE PARTNERSHIPS (PPPS) SEE A DETAILED PPP SECTION LATER IN THIS SECTION

- Collaborate with private companies, developers, and investors. PPPs involve joint efforts between the public sector and private entities to fund and execute projects.

- For instance, a developer might invest in the Awali riverfront revitalization project in exchange for development rights in the area.

3. CROWDFUNDING CAMPAIGNS

- Engage Joun residents and businesses by launching crowdfunding campaigns. Platforms like *Kickstarter, GoFundMe*, or local crowdfunding websites can help raise funds for specific projects.

- This of course will require highlighting the impact of each project and encourage Joun community members to contribute.

4. CORPORATE OR POLITICAL SPONSORSHIPS

- Approach local businesses or politicians for sponsorships. In exchange for financial support, businesses can receive recognition (e.g., signage, naming rights) associated with the project.

- Consider naming community spaces after sponsoring companies or political donors.

5. USER FEES AND RENTALS:

- Generate revenue by charging user fees for certain facilities (e.g., Joun Community Center, Awali River Cabins Rentals, Joun Swimming Pool Club, Joun Sports Complex, Café, Picnic Area, and even event spaces).

- Rent out public spaces for events, workshops, or local produce markets.

6. LEBANESE GOVERNMENT OR INTERNATIONAL ORGANIZATIONS COMMUNITY DEVELOPMENT DONATIONS OR GRANTS:

- Explore programs that provide funding for Municipalities Sustainable Development projects, Social Cohesion Initiatives, infrastructure, and community development.

7. LOCAL FUNDRAISING EVENTS:

- Organize events like charity runs, auctions, or festivals. Proceeds can go toward specific projects.

- Engage local artists from Joun, musicians, and volunteers to participate.

A combination of funding sources may be necessary. Projects should be prioritized based on their impact, feasibility, and alignment with Joun's vision. Also important is to communicate transparently with Joun residents about funding decisions and involve them in the process.

ABOUT FUNDERS AND DONORS - LEBANON

ABOUT THE MUNICIPAL EMPOWERMENT AND RESILIENCE PROJECT (MERP)

MERP is a joint project by the United Nations Development Programme (UNDP) and the United Nations Human Settlements Programme (UN-Habitat). The Project is being implemented between 2019 and 2022 in partnership with the Ministry of Interior and Municipalities (MoIM) and funded by the European Union (EU), through its Regional Trust Fund in Response to the Syrian Crisis, the EU Madad Fund. The project aims to strengthen the long-term resilience of subnational authorities in Lebanon as well as host communities and displaced persons affected by the Syrian crisis. https://bit.ly/3hBveux

ABOUT THE EUROPEAN UNION (EU)

The European Union supports Lebanon's stability, independence and sovereignty, its prosperity and democratic order. It strives also to help protect its environment and natural resources by supporting sustainable enterprise and development. The European Union is also committed to the promotion and protection of human rights in Lebanon including defending gender equality, children's rights and freedom of expression.

EU assistance to Lebanon is primarily funded through the Neighborhood, Development and International Cooperation Instrument (NDICI) for the period 2021-2027.

As set out in the Multiannual Indicative Programme (MIP) 2021-2027, the priority areas for cooperation are:

- Enhancing good governance and supporting reforms;
- strengthening an inclusive and resilient economy; and
- promoting a green and sustainable recovery.

The EU's total assistance to Lebanon since 2011 amounts to over €3 billion. This includes:

- €670.3 million in bilateral assistance.
- €1.5 billion in resilience assistance channeled through the EU Regional Trust Fund in Response to the Syrian Crisis since its creation in 2015 to help Lebanon cope with the impact of the Syria crisis, supporting refugees from Syria to strengthen their resilience and to become self-reliant, as well as supporting Lebanese host communities.
- €860 million in humanitarian assistance in response to the most urgent needs of refugees from Syria and vulnerable Lebanese.
- €61 million under the Instrument contributing to Stability and Peace and €2.7 million under the European Instrument for Democracy and Human Rights.

The promotion and protection of human rights is an overarching theme for EU assistance in Lebanon, in line with the European consensus on development. Transparency, accountability, and the fight against corruption are pursued in all actions supported by bilateral cooperation.

Through the EU Roadmap for engagement with Civil Society in Lebanon, the EU continues to further deepen the partnership approach with civil society in promoting an enabling environment for their long-term engagement in the development and reform process in Lebanon. The EU Delegation in Lebanon represents the European Union to the Republic of Lebanon with the objective to maintain and develop mutual beneficial relations. It engages in political, social and economic development activities on behalf of the European Union and based on the most pressing needs of the country of Lebanon.

ABOUT THE UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)

UNDP is the leading United Nations organization fighting to end the injustice of poverty, inequality and climate change. Working with their broad network of experts and partners in 170 countries, they help nations to build integrated, lasting solutions for people and the planet.

ABOUT THE UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME (UN-HABITAT)

UN-Habitat works in over 90 countries supporting people in cities and human settlements for a better urban future. Working with governments and local partners, its high impact projects combine world-class expertise and local knowledge to deliver timely and targeted solutions. The 2030 Agenda for Sustainable Development includes a dedicated Goal on cities, SDG 11 – to make cities inclusive, safe, resilient and sustainable.

ABOUT CANADA'S STRATEGY FOR LEBANON

Canada's programming and engagement in Lebanon are key components of Canada's whole-of-government Middle East Strategy. Canada has invested over $4 billion over six years (2016-2022) to respond to the ongoing crises in Iraq and Syria, and their impact in the region, in particular on Jordan and Lebanon.

These crises have had a significant effect on Lebanon. As a proportion of its population, Lebanon hosts the largest number of refugees in the world; about one in three people in Lebanon are refugees. This has put an enormous strain on the local communities that provide essential services and causes tensions between refugees and host communities over housing, jobs, food prices, schools, and health facilities.

To help address the effects of the conflict on Lebanon, Canada is supporting several strategic objectives:

- Supporting key actors at the local level to foster social cohesion, community peacebuilding and inclusive governance
- Canada seeks to enhance stability and address drivers of conflict in Lebanon. Stabilization efforts focus on supporting Lebanon's efforts to improve its state security services and make justice accessible to all.
- The goal is to reduce social tensions between the Lebanese hosts and refugees and build positive relationships within communities.
- Canada is also supporting the efforts of Lebanese municipalities to improve security in at-risk communities.

ABOUT THE RENÉ MOAWAD FOUNDATION (RMF)

The René Moawad Foundation (RMF) is a Lebanese non-profit, non-political, non-sectarian organization that was established on November 22, 1991. RMF's mission is to promote social, economic and rural development in Lebanon and the MENA region and contribute in building a responsible civil society that promotes democratic values, justice, pluralism and moderation. As one of the largest NGOs working all over Lebanon, RMF empowers the human being both intellectually and financially through 5 core sectors: education and human development, health and social care, economic development, agriculture and rural development, local authorities and decentralization, to guarantee their dignity and basic rights, and to build their capacities as responsible citizens.

TWO NOTABLE GRANTS RELATED TO WASTE MANAGEMENT AND ENVIRONMENTAL RECOVERY IN LEBANON:

1. Reduction of Unintentional Persistent Organic Pollutants through Waste Management in a Circular Economy:

- Grant Amount: US$8.86 million.

- Purpose: This grant aims to reduce harmful emissions from the open burning of solid waste, improve solid waste management (including recycling and composting) at the municipal level, and minimize exposure to hazardous substances for residents in the North and South of Lebanon.

- Financed By: The Global Environment Facility (GEF), the world's largest funder of biodiversity protection, nature restoration, pollution reduction, and climate change response in developing countries[1].

2. Beirut Critical Environment Recovery, Restoration, and Waste Management Program:

- Grant Amount: US$10 million.

- Purpose: This grant supports Lebanon in mitigating the environmental and health impacts of the Port of Beirut explosion on neighboring populations. It also contributes to developing a strategic plan for greening Beirut's reconstruction.

- Financed By: The Lebanon Financing Facility (LFF), a multi-donor trust fund established to support socio-economic recovery after the 2020 Port of Beirut explosion[3].

ABOUT Public-private Partnerships (PPP)

Public-private partnerships (PPPs) are collaborative arrangements between government entities and private sector organizations to deliver public services or infrastructure projects.

HERE ARE SOME COMMON PPP CONTRACT TYPES AND TERMINOLOGY:

1. Build – Operate – Transfer (BOT): In this model, the private party builds and operates the asset for a specified period before transferring it back to the government.

2. Build – Own – Operate – Transfer (BOOT): Similar to BOT, but the private party retains ownership during the contract term.

3. Build – Own – Operate (BOO): The private party builds and operates the asset without transferring ownership.

4. Design-Build: The private party is responsible for both designing and constructing the asset.

5. Design-Build – Finance: In addition to design and construction, the private party provides financing.

6. Design-Build – Finance – Operate (DBFO): Includes design, construction, financing, and operation.

7. Design-Build – Finance – Maintain – Operate (DBMFO): Extends DBFO to include maintenance.

8. Design – Construct – Maintain – Finance (DCMF): Covers design, construction, maintenance, and financing.

9. Operation & Maintenance (O&M) : The private party handles asset operation and maintenance.

10. Buy-Build-Operate (BBO): Involves purchasing an existing asset, upgrading it, and operating it.

11. Operating License: The private party operates the asset under a license.

2023 Aid Tracking Lebanon

Q4 report (1 January – 31 December)

5. contributions to the Lebanon Crisis Response Plan in 2023 reported by implementing partners by sector in USD million

Sector	A. Received in 2023	B. Carry over from 2022*	C. Available in 2023	E. Appeal 2023 (Needs)	Percent Funded**
Energy	$1.8 M	$1.4 M	$3.2 M	$99.2 M	3%
Nutrition	$3.2 M	$1.0 M	$4.3 M	$45.0 M	10%
Shelter	$19.0 M	$.3 M	$19.3 M	$115.2 M	17%
Food Security	$175.4 M	$137.6 M	$313.0 M	$1300.5 M	24%
Basic Assistance	$143.3 M	$27.1 M	$170.4 M	$493.6 M	35%
Livelihoods	$47.5 M	$44.6 M	$92.2 M	$247.5 M	37%
Water	$81.2 M	$12.9 M	$94.1 M	$206.5 M	46%
Health	$130.1 M	$42.4 M	$172.5 M	$317.8 M	54%
Social Stability	$58.8 M	$44.2 M	$103.0 M	$171.0 M	60%
Protection	$135.2 M	$7.2 M	$142.5 M	$235.2 M	61%
Education	$142.0 M	$78.8 M	$220.8 M	$362.7 M	61%
Not yet allocated	$1.9 M	$.0 M	$1.9 M	$.0 M	
Total	$939.4 M	$397.7 M	$1337.1 M	$3594.2 M	37%

* This total reported by partners includes unspent LCRP funds received before 2023 and funds received in 2022 for 2023 activities.

** Available funds include funds received in 2023 and funds carried over from 2022. In total, partners have 37% of the funding required to implement activities under the 2023 LCRP.

3. Top ten donors in 2019 in USD (as of December 2019)

Rank	Donor	Funds disbursed in 2019 (USD)	Share of total
1	USA	453,063,493	30%
2	EU	389,260,800	25%
3	UK	171,059,872	11%
4	Germany	169,061,487	11%
5	Norway	61,863,116	4%
6	Canada	60,853,459	4%
7	Netherlands	43,110,575	3%
8	Australia	25,732,170	2%
9	Italy	23,885,596	2%
10	France	16,930,825	1%
Total		1,414,821,393	93%

AN EXAMPLE SAMPLE PROJECT PROPOSAL ON WASTE MANAGEMENT AND RECYCLING PROJECTS

Project Overview: The objective of this project is to establish a comprehensive waste management and recycling system that addresses the following key areas:

Project Overview: The objective of this project is to establish a comprehensive waste management and recycling system that addresses the following key areas:

- Waste Assessment and Analysis: Conduct a detailed analysis of the existing waste management practices in our community to identify the current waste generation patterns, disposal methods, and potential areas for improvement.
- Awareness and Education: Develop and implement a comprehensive awareness campaign to educate the community about waste reduction techniques, proper waste segregation, recycling benefits, and the environmental impact of irresponsible waste disposal.
- Infrastructure Development: Establish efficient waste collection points, recycling centers, and processing facilities to facilitate proper waste management and recycling practices. This includes partnering with local authorities, waste management companies, and recycling facilities to ensure an integrated and sustainable waste management infrastructure.
- Stakeholder Engagement: Collaborate with local businesses, educational institutions, community organizations, and government agencies to encourage their active participation and support in waste management and recycling initiatives. This will involve organizing workshops, seminars, and training sessions to promote best practices and foster a sense of shared responsibility.

Project Objectives:

Our project aims to achieve the following objectives:

- Reduce waste generation by 20% within the first year of implementation through effective waste reduction techniques and behavioral changes.
- Increase recycling rates by 30% within the first two years by providing accessible recycling facilities, educating the community about the benefits of recycling, and implementing convenient recycling programs.
- Minimize improper waste disposal and littering by establishing efficient waste collection systems and promoting responsible waste management practices.
- Create employment opportunities by establishing recycling centers and processing facilities, leading to economic growth and social benefits for the community.

Project Timeline:

The project is expected to be implemented over a period of [duration]. The timeline will be divided into the following phases:

- Phase 1: Project Planning and Research
- Phase 2: Awareness Campaign and Education

- Phase 3: Infrastructure Development
- Phase 4: Stakeholder Engagement and Partnerships
- Phase 5: Monitoring and Evaluation

Budget and Resources: The estimated budget required for the successful implementation of this project is [amount]. This includes costs associated with research, awareness campaigns, infrastructure development, stakeholder engagement activities, staff salaries, and monitoring and evaluation. We will explore various funding options, such as grants, sponsorships, and partnerships, to ensure the availability of necessary resources.

Expected Outcomes and Evaluation: We will monitor and evaluate the project's progress at regular intervals to assess the effectiveness of the implemented strategies and measure the achievement of the set objectives. Key performance indicators will include waste reduction rates, recycling rates, community participation, and overall environmental impact. The findings will be used to fine-tune the project's implementation and make necessary adjustments to maximize its impact.

Conclusion: Implementing an efficient waste management and recycling system is crucial for creating a sustainable future. We believe that by initiating this project, we can make a significant contribution to environmental conservation and community well-being. We are confident that our collective efforts will result in a cleaner, healthier, and more environmentally conscious community.

We request your support and collaboration in making this project a reality. Together, we can make a positive difference in waste management and recycling practices. We are open to discussing this proposal further and addressing any questions or concerns you may have.

AN EXAMPLE SAMPLE PROJECT PROPOSAL ON DEVELOPING WASTE MANAGEMENT SYSTEMS FOR POLLUTION REDUCTION, RECYCLING PROMOTION, AND SANITATION IMPROVEMENT

Project Overview:

This project proposal aims to address the critical issue of waste management by developing comprehensive systems that effectively reduce pollution, promote recycling, and improve sanitation. The project's primary objective is to create sustainable waste management practices that align with environmental conservation goals, community health, and resource optimization. Through collaboration with local authorities, waste management experts, and community stakeholders, this project seeks to implement innovative strategies and infrastructure to achieve long-term environmental benefits and create a healthier, cleaner, and more sustainable future.

Project Overview:

Upcoming Grants to Watch for in August 2024

Mark Your Calendars and Be Prepared to Submit Applications

- Project Title: Developing Waste Management Systems for Pollution Reduction, Recycling Promotion, and Sanitation Improvement
- Project Duration: [Insert Duration] 2.3
- Project Location: [Specify Target Area(s)]

Objectives:

The project aims to achieve the following objectives:

- Pollution Reduction:
    - Implement waste segregation systems to minimize the amount of waste sent to landfills.
    - Develop efficient waste collection mechanisms to prevent littering and illegal dumping.
    - Promote awareness campaigns to educate the public on the adverse effects of pollution and the importance of responsible waste disposal.
- Recycling Promotion:
    - Establish recycling infrastructure, including recycling centers and collection points.
    - Encourage the adoption of recycling practices through incentives and public education programs.
    - Facilitate partnerships with recycling industries to ensure the effective management of recyclable materials.
- Sanitation Improvement:
    - Upgrade existing sanitation facilities and develop new infrastructure to enhance waste disposal and treatment.
    - Implement proper waste disposal practices in public spaces, residential areas, and commercial establishments.
    - Conduct regular maintenance and monitoring to ensure the cleanliness and functionality of sanitation systems.

Project Activities:

Upcoming Grants to Watch for in August 2024

Mark Your Calendars and Be Prepared to Submit Applications

- Waste Assessment and Planning:
    - Conduct a comprehensive waste assessment to understand the current waste generation patterns, sources, and composition.
    - Develop a waste management plan tailored to the specific needs and challenges of the target area(s).
    - Identify key stakeholders and establish partnerships for effective collaboration throughout the project.
- Infrastructure Development:

        - Establish waste collection points strategically located across the target area(s).
        - Construct recycling centers equipped with sorting and processing facilities.
        - Upgrade existing landfill sites or explore alternative waste disposal methods, such as waste-to-energy conversion or composting.
    - Education and Awareness Campaigns:
        - Organize workshops, seminars, and community events to educate the public about waste management practices, recycling, and pollution prevention.
        - Distribute educational materials, including brochures, posters, and online resources.
        - Collaborate with local schools and educational institutions to integrate waste management topics into their curricula.
    - Monitoring and Evaluation:
        - Establish a robust monitoring system to track waste management indicators, such as waste diversion rates, recycling volumes, and pollution levels.
        - Regularly evaluate the effectiveness of implemented strategies and make necessary adjustments based on feedback and data analysis.
        - Ensure compliance with environmental regulations and standards throughout the project's lifecycle.

Expected Outcomes:

- Reduced pollution levels through effective waste management practices, leading to improved environmental quality.
- Increased recycling rates, resulting in the conservation of valuable resources and reduction of landfill usage.
- Enhanced sanitation infrastructure, contributing to improved public health and hygiene standards.
- Heightened public awareness and engagement in sustainable waste management practices.

Budgetary Requirements:

A detailed budget plan will be developed during the project planning phase, considering factors such as infrastructure development, education campaigns, monitoring systems, personnel, and operational costs.

Upcoming Grants to Watch for in August 2024

Mark Your Calendars and Be Prepared to Submit Applications

Project Sustainability:

To ensure the long-term sustainability of the waste management systems, the project will focus on capacity building and local empowerment. This includes training local

personnel, fostering partnerships with local waste management entities, and engaging the community in decision-making processes. Additionally, revenue generation opportunities, such as the sale of recycled materials, can be explored to support the ongoing operations and maintenance of the waste management systems.

Conclusion:

By developing comprehensive waste management systems that target pollution reduction, recycling promotion, and sanitation improvement, this project aims to create a cleaner and more sustainable environment. Through strategic planning, community engagement, and continuous monitoring, we can achieve significant positive impacts on public health, resource conservation, and environmental well-being. We invite your support and collaboration to make this project a reality and create a lasting impact on the communities we serve

INVOLVING LOCAL SCHOOLS AND BUSINESSES IN YOUR WASTE REDUCTION PROJECT

Involving local schools and businesses in your waste reduction project is a great way to create a positive impact.

Here are some practical steps:

1. Collaborate with Local Businesses:

- Reach out to nearby businesses that are already involved in recycling initiatives.

- Explore partnerships for promoting plastic-free alternatives or donating reusable materials[1].

2. Organize Community Cleanup Events:

- Work with schools to organize community cleanup events.

- These events raise awareness about plastic waste and engage students and businesses in hands-on efforts[2].

3. Implement Recycling Programs:

- Collaborate with local waste management authorities to set up recycling programs.

- Schools can collect recyclables like bottles, glass, plastic, newspapers, or books and take them to recycling centers or charities in need[2].

In brief: involving schools and businesses amplifies your project's impact and fosters a sense of community responsibility.

COMMON PITFALLS TO AVOID WHEN APPLYING FOR GRANTS

When applying for grants, it's crucial to avoid common pitfalls. Here are some mistakes to steer clear of:

1. Not Following Instructions:

- Always adhere to the grant guidelines precisely. Pay attention to details like formatting, required documents, and submission deadlines[1].

- If they ask for a three-year budget or specific materials, ensure you provide them.

2. Weak Proposal Writing:

- Craft a clear and compelling narrative. Focus on outcomes and impact.

- Avoid vague or confusing language; simplicity wins[1].

3. Incomplete or Inaccurate Applications:

- Double-check your application for completeness and accuracy.

- Missing information or errors can harm your chances[2].

4. Lack of Focus on Outcomes:

- Emphasize how your project benefits the community or addresses a specific need.

- Don't solely focus on your organization's internal needs[2].

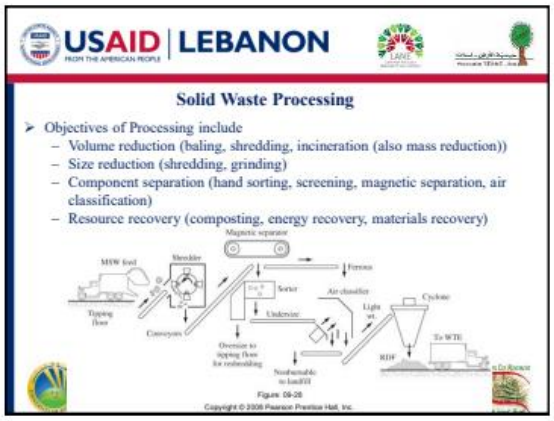
5. Inadequate Follow-up:

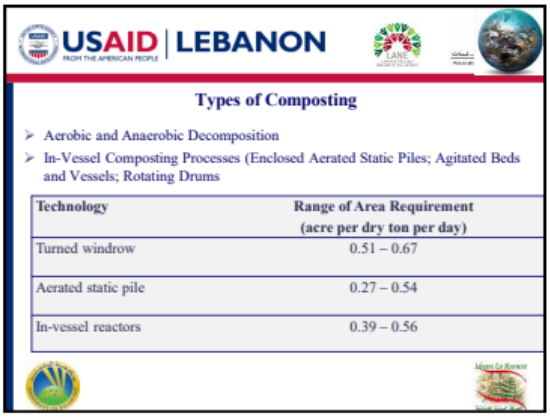
- After submitting, follow up appropriately. Show your commitment and interest.

- Ignoring communication or failing to provide requested updates can be detrimental[2].

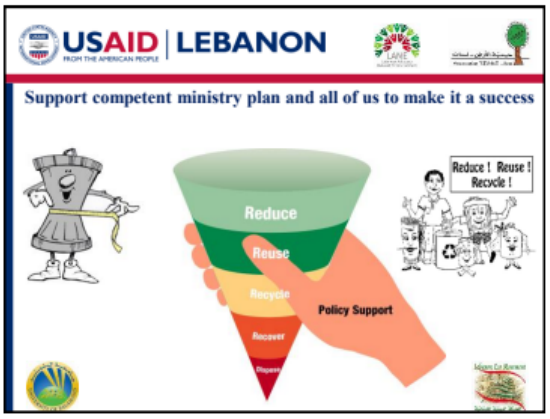
APPENDIX

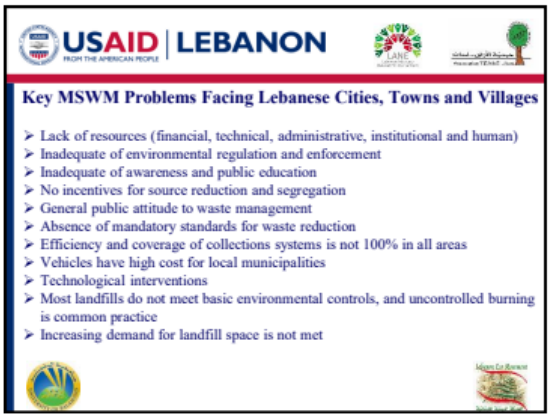
Useful Information:





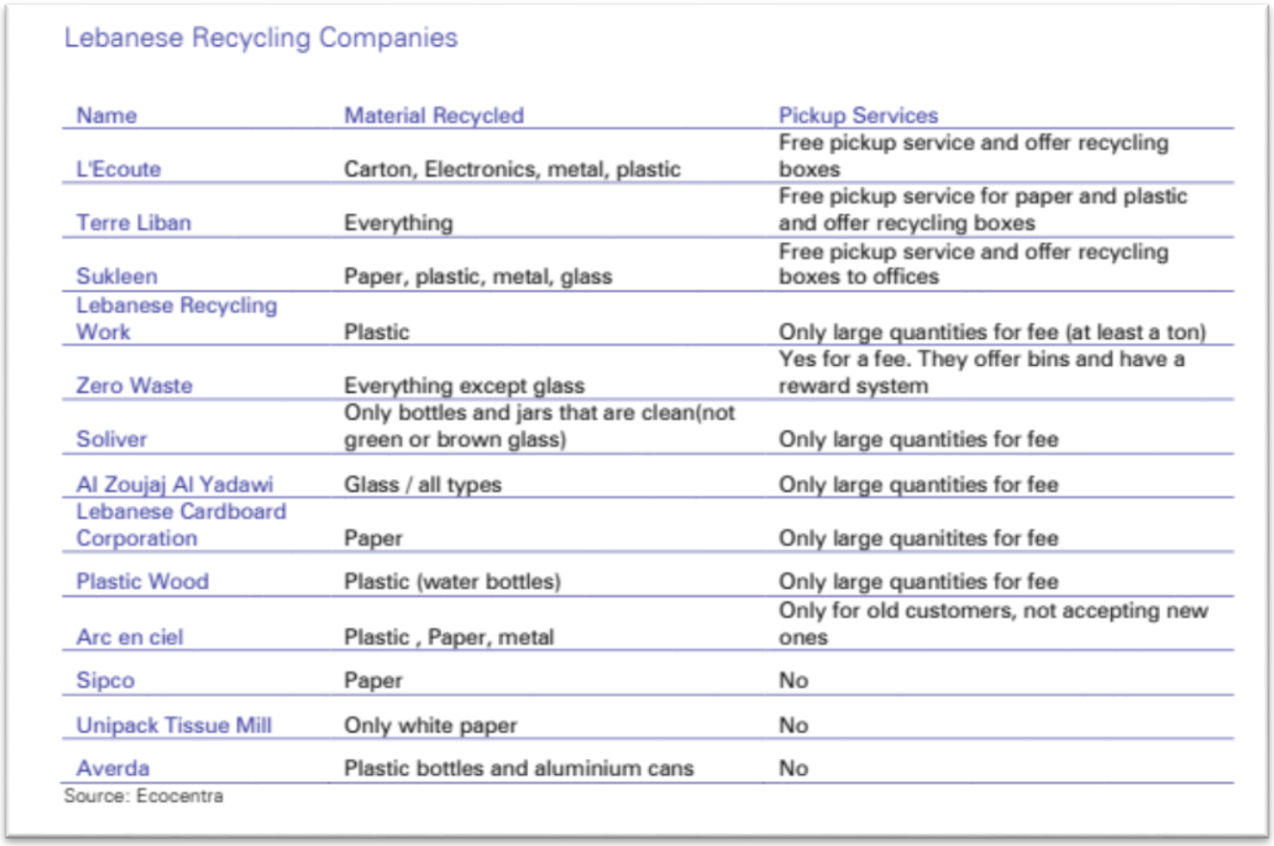
Technology	Range of Area Requirement (acre per dry ton per day)
Turned windrow	0.51 – 0.67
Aerated static pile	0.27 – 0.54
In-vessel reactors	0.39 – 0.56


USAID | LEBANON
Support competent ministry plan and all of us to make it a success
Reduce
Reuse
Recycle
Recover
Dispose
Policy Support
Reduce ! Reuse ! Recycle !


USAID | LEBANON
Key MSWM Problems Facing Lebanese Cities, Towns and Villages
Lack of resources (financial, technical, administrative, institutional and human)
Inadequate of environmental regulation and enforcement
Inadequate of awareness and public education
No incentives for source reduction and segregation
General public attitude to waste management
Absence of mandatory standards for waste reduction
Efficiency and coverage of collections systems is not 100% in all areas
Vehicles have high cost for local municipalities
Technological interventions
Most landfills do not meet basic environmental controls, and uncontrolled burning is common practice
Increasing demand for landfill space is not met


USAID | LEBANON
Appropriate solid waste treatment method has to be selected, keeping in view the following objectives:
1. Should be economically viable
2. Should not create a health hazard
3. Should not cause adverse environmental effects
4. Should not result in unpleasant sight, odor, and noise
5. Should not overoptimistic assessment of technical institutional and financial feasibility along with technical skills and available operation and maintenance.
Be realistic about viability and practicability of MSW treatment technologies and cautious about committing to large investments.
We need to move away from waste disposal to waste management

Lebanese Recycling Companies



Lebanese Recycling Companies

Name	Material Recycled	Pickup Services
L'Ecoute	Carton, Electronics, metal, plastic	Free pickup service and offer recycling boxes
Terre Liban	Everything	Free pickup service for paper and plastic and offer recycling boxes
Sukleen	Paper, plastic, metal, glass	Free pickup service and offer recycling boxes to offices
Lebanese Recycling Work	Plastic	Only large quantities for fee (at least a ton)
Zero Waste	Everything except glass	Yes for a fee. They offer bins and have a reward system
Soliver	Only bottles and jars that are clean(not green or brown glass)	Only large quantities for fee
Al Zoujaj Al Yadawi	Glass / all types	Only large quantities for fee
Lebanese Cardboard Corporation	Paper	Only large quanitites for fee
Plastic Wood	Plastic (water bottles)	Only large quantities for fee
Arc en ciel	Plastic , Paper, metal	Only for old customers, not accepting new ones
Sipco	Paper	No
Unipack Tissue Mill	Only white paper	No
Averda	Plastic bottles and aluminium cans	No

Source: Ecocentra

Some practical information

CONTACTS OF ACTORS INVOLVED IN THE WASTE MANAGEMENT CHAIN

REGION	MUNICIPALITY	ACTIVITY	NAME	TYPE	CONTACT	MATERIALS
Bekaa	Taadod Riyak	Storage / Trading	Abou Ahmad el Achhab	Company	03-201324	Metal/Lead
South	Nabitiyeh	Collection / Trading	Ahmad Chaib	Company	03-314608	Metal
South	Zahrani	Storage / Trading	Ahmad Khalife	Company	03-243514 / 07 -222106	Metal/Lead
South	Sarafand	Pre-treatment / Treatment	Al Zoujaj al Yadawi	Company	03-906091	Glass
Beirut	Bourj el Barajneh	Pre-treatment / Treatment	Alpha Plast Est. trading	Company	01-471507 / 03-750290	Plastic (HDPE)
Beirut	Bourj el Barajneh	Pre-treatment / Treatment	Alpha Plast Est. trading	Company	01-471507 / 03-750290	Plastic (HDPE)
Beirut	Chouwaifat	Pre-treatment / Treatment	Aluxal	Company	05-480406	Aluminum
Bekaa	Taanayel	Collection/Pre-treatment /Treatment	arcenciel	NGO	01-495561 ext 1413	Plastic, Paper, Cardboard
Beirut	Baabda	Collection / Pre-treatment	arcenciel	NGO	01-495561 ext 1414	Plastic, Paper, Cardboard

Beirut	Beirut	Collection / Treatment	Averda	Company	01-360000 / 01-364444	All
South	Tyre	Pre-treatment / Treatment	Baza Plast	Company	07-376376 / 03-780282	Plastic (All)
Beirut	Dora	Collection / Treatment	Beeatoona	NGO	01-249653 / 71-974751	Paper/Cardboard
Mt Lebanon	Jbeil	Collection / Trading	Byblos ecologia	NGO	03-444401	Plastic PET (Water Bottles)
Beirut	Beirut	Pre-treatment / Treatment	Cedar Environmental	NGO	03-293222	Compost, Plastic, glass
Mt Lebanon	Mazraet Youcheh	Pre-treatment / Treatment	Charbel Daou	Company	04-913300	Textiles
Mt Lebanon	Mtaileb	Pre-treatment / Treatment	Elie Daou	Company	03-620850	Textiles
Beirut	Dekwaneh	Collection / Trading	Elie Sawma	Company	01-689105 / 03-666520	Paper/Cardboard
Beirut	Bouchrieh	Pre-treatment / Treatment	Ets. Carlo pour le Baouchrieh	Company	03-888006 / 01-500293	Aluminum
Beirut	Borj Hammoud	Pre-treatment / Treatment	Garabed Babahekian	Company	01-261029	Lead
Bekaa	Taadod Riyak	Collection / Trading	Hanine Trading	Company	03-201324	Metal/Lead
Beirut	Beirut	Collection / Trading	Hsain Daher	Company	03-498663	Paper/Cardboard
Beirut	Ouzai	Collection / Trading	Hussein Daher	Company	03-498663	Plastic (PET, HDPE)
Bekaa	Niha/Timnin	Pre-treatment / Treatment	Issam Kassem Ets. For commerce & industry	Company	08-911119	Plastic (All)
South	Saida	Pre-treatment / Treatment	Kama Plast	Company	07-222200	Plastic (HDPE)

REGION	MUNICIPALITY	ACTIVITY	NAME	TYPE	CONTACT	MATERIALS
Beirut	Fanar	Pre-treatment / Treatment	Kilzi & Co. S.A.R.L.	Company	01-872133/4/5 03-896669	Plastic (PP)
Beirut	Zoukak el Blat	Collection / Pre-treatment	L'Ecoute	NGO	70-391908	Carton, electronics, metal, plastic
Tripoli/North	Tripoli	Collection / Landfilling	Lavajet	Company	04- 522228	Landfilling bulk waste
North	Tripoli		Lebanese Companies For Raw Materials		03-281434	
Tripoli/North	Beddawi	Pre-treatment / Treatment	Lebanese Metal Industry	Company	03-281434	Lead
Beirut	Roumieh	Pre-treatment / Treatment	Lebanese Recycling Works	Company	01-890383 / 03-307060	Plastic (All)
Tripoli/North	Tripoli	Pre-treatment / Treatment	Lebanese Recycling Works	Company	70-955909	
Beirut	Nahr El Mot	Pre-treatment / Treatment	Liban fonderie	Company	01-897619	Metal
Bekaa	Qab Elias	Pre-treatment / Treatment	Mazar Plast	Company	08-500623 / 03-843929	Plastic (HDPE)
Bekaa	Qaa El Eim	Pre-treatment / Treatment	Mimoza	Company	08-803052	Paper/Cardboard
Mt Lebanon	Kfarshima	Pre-treatment / Treatment	Ohanis Kasarjian	Company	05-462462	Metal
South	Toul	Collection / Treatment	OLA 3R	Company	03-977041	Rubber Tires
Bekaa	Taanayel	Pre-treatment / Treatment	Oreibi	Company	08-510194	Lead
Bekaa	Zahle	Pre-treatment / Treatment	Panda Plast	Company	01-650888 / 01-650660	Plastic
South	Zahrani	Pre-treatment / Treatment	Plastic Chem Company	Company	07-223535 / 03-337788	Plastic (HDPE, PVC)
Beirut	Sin El Fil	Collection / Trading	Plastic Wood	Company	01-491152	Plastic (water bottles)
Mt Lebanon	Baakline	Pre-treatment / Treatment	Publitex Co	Company	03-607678	Plastic (HDPE)
Mt Lebanon	Jbeil	Pre-treatment / Treatment	Rocky Plast	Company	03-634400	Plastic (HDPE)
Beirut	Shatila	Pre-treatment / Treatment	Sharmetal	Company	01-823675/6 / 03-810876	Metal/Lead
Bekaa	Qab Elias	Pre-treatment / Treatment	Sicomo	Company	08-500550	Paper/Cardboard
Mt Lebanon	Zouk Mosbeh	Pre-treatment / Treatment	Sidem	Company	09-220163/1	Aluminum
Mt Lebanon	Kfarchima	Pre-treatment / Treatment	SIPCO	Company	05-431048	Paper/Cardboard
Mt Lebanon	Wadi Shahrour	Pre-treatment / Treatment	Solicar	Company	05-940248	Paper/Cardboard
Beirut	Chouwaifat	Pre-treatment / Treatment	Soliver	Company	05-803903	Glass
Bekaa	Zahle	Pre-treatment / Treatment	Somoplast	Company	08-930718	Plastic (PET)
Beirut	Beirut	Collection / Pre-treatment	Terre Liban	NGO	03-327975	Paper/Cardboard

Mt Lebanon	Halat	Pre-treatment / Treatment	Unipack/Tissue Mill	Company	09-477191	Paper/Cardboard
Tripoli/North	Baddawi Industrial City	Pre-treatment / Treatment	United Glass Products Co	Company	06-389107 / 03-230247	Glass
Beirut	Badaro	Collection / Pre-treatment	Zero Waste act	Company	01-381381	All

EQUIPMENT SUPPLIERS

Trailers suppliers

Medevco

tel : +961 9 233 550 / 1 / 2 | email :info@medevco.me | adresse : Jeita- Jrita Main Road

Panda Plast

tel : +961 8 911 119 / +961 8 912 024 | email : sales@pandaplast.com | adresse: Niha- Bekaa

3M Plast industrial Company

tel : +961 7 224 400 / +961 7 224 468 | adresse : Ghazieh - Zahrani main road

Conveyors suppliers

Technica

tel : +961 70 866 470

Mepaq

tel : +961 1 481 565 | email : info@mepaq.com | adresse: sin el fil

Bou Chalhoub

tel : +961 8 930 999 | email : info@chalhoub-est.com | adresse: Zahle

Cedar Environmental

tel : +961 1 389 404 / +961 3 293 222 | email : info@cedarenv.com

Rollers providers

Bou Chalhoub

tel : +961 8 930 999 | email : info@chalhoub-est.com | adresse: Zahle

Cedar Environmental

tel : +961 1 389 404 / +961 3 293 222 | email : info@cedarenv.com

Zakka

tel : +961 1 890 654 | email : info@zakkamultitec.com | adresse : Zakka Bldg, Fanar

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(6) undefined. http://www.peacecorps.gov.

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