



ENVIRONMENTAL POLITICS SERIES

# UNPACKING SOLID WASTE MANAGEMENT POLICIES IN LEBANON:

*PUBLIC POLICIES BASED ON POWER-  
SHARING POLITICS RATHER THAN  
EVIDENCE-BASED DECISION-MAKING*

■■■ HEINRICH BÖLL STIFTUNG  
BEIRUT  
Middle East



Arab  
Reform  
Initiative

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Cover Photo: Picture taken by the author in February 2022 showing one of many piles of waste in a street in Mount Lebanon.

August 2022

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# Introduction

Piles of garbage have again been accumulating on the streets of major Lebanese cities<sup>1,2</sup>. A scenario that is all too familiar and takes us back to 2014 when Sukleen – the company contracted to manage solid waste in Beirut and Mount Lebanon – halted its operations and streets were filled with piles of garbage for months<sup>3</sup>. Once again Lebanon is on the verge of another waste crisis, but this time from a more vulnerable and dire state. Solid waste has been ravaging the streets of Beirut and Mount Lebanon for numerous reasons. These include the contractor not getting paid, the high cost of transportation which reduces the frequency of collection<sup>4</sup>, the closure of landfills which are at capacity, or even the obstruction of works at the landfills due to trespassers waiting to collect metals and other valuable materials to sell them amid Lebanon’s heaviest economic and financial crises<sup>5</sup>.

The absence of sustainable and integrated solid waste management (SWM) in Lebanon has denied citizens their right to health<sup>6</sup>. Open dumping and burning, which have been occurring due to the inaction of regulatory authorities, have negative health impacts on nearby residents. Some individuals have reported respiratory illnesses and skin problems, while others complain about bad mental health<sup>7</sup>. Additionally, open burning could be linked to cancer and heart disease. These practices have disproportionately affected poor communities, given that burning sites are often in their vicinity and that they cannot afford health care<sup>8</sup>.

Moreover, the cost of environmental degradation due to the lack of a comprehensive SWM plan was equivalent to \$66.5 million in 2012<sup>9</sup> and \$200 million in 2018<sup>10</sup>. The cost of environmental degradation is reflected by a loss of welfare demonstrated by the degradation in the quality of life, economic losses, and environmental losses, among others<sup>11</sup>. The solid waste sector contributed to around 10% of the country’s greenhouse gas emissions in 2011, largely due to open dumping and burning across the country<sup>12,13</sup>.

An integrated solid waste management strategy at the national level is the only long-term solution to the solid waste problem. In the absence of such a plan, and following the solid waste crisis in 2015, several grassroots movements, civil society organizations and municipalities have tried to remedy the absence of a national plan by leading small-scale interventions based on sorting at source and waste valorization in order to minimize volumes of waste sent to landfills<sup>14,15,16</sup>. However, none of these projects is implementable at the national level, since these initiatives rely on a municipality’s rare, and voluntary will. This paper employs a systems analysis to explore how solid waste mismanagement has been an intentional political decision-making process tailored to nurture and protect dysfunctionality through elite capture and clientelism. The hypothesis will be presented using a Causal Loop Diagram (CLD) which will then be analyzed and validated via case studies involving the municipalities of Beit Mery, Dhour Choueir, and Brih.

1 [The Daily Star](#)

2 [L’Orient-Le Jour](#)

3 [Naharnet](#)

4 [Al Jazeera](#)

5 [Arab News](#)

6 International Covenant on Economic, Social and Cultural Rights (ICESCR), adopted December 16, 1966, G.A. Res. 2200A (XXI), 21 U.N. GAOR Supp. (No. 16) at 49, U.N. Doc. A/6316 (1966), 993 U.N.T.S. 3, entered into force January 3, 1976, ratified by Lebanon on November 3, 1972, art. 12.

7 [HRW](#)

8 [HRW](#)

9 Arif and Doumani (2014)

10 [Ministry of Environment](#)

11 [Arif and Doumani \(2014\)](#)

12 [Ministry of Environment](#)

13 [Triangle](#)

14 [US Environmental Protection Agency](#)

15 [Lebanon SOER Report](#)

16 [K2P Evidence Summary](#)

**02 Unpacking solid waste management policies in Lebanon:**

# 1. Solid waste in Lebanon: a chronic problem emerging from complex systems

The recurring SWM crises are rooted in Lebanon's post-war political system. Following the 1989 Ta'if agreement, governmental decision-making has been shaped by inter-confessional elite capture rather than strategic policies based

on evidence. Elite capture happens when public resources are mobilized or appropriated by a particular subgroup, to further self-interest. Self-interest and nepotism have been the basis of public procurement, by which the purpose of public contracts, particularly those for managing solid waste, has been to benefit elites and their circles rather than serve the common good<sup>17</sup>.

## 1.1. A retrospective of environmental policies (or lack thereof)

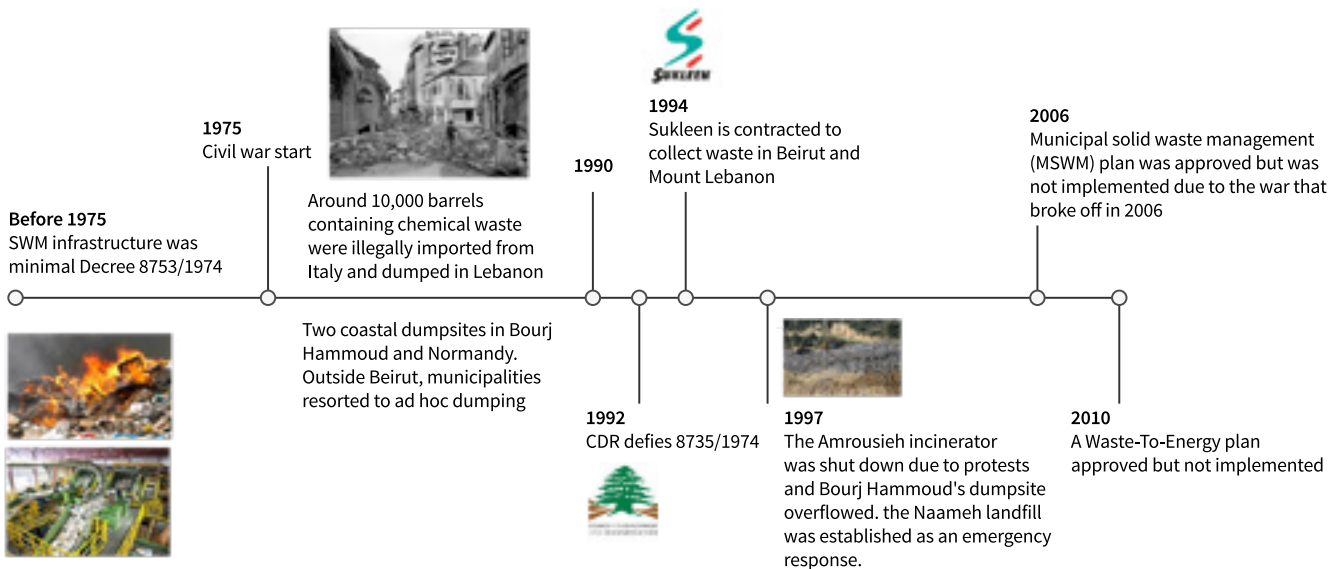


Figure 2: A timeline of environmental policies by the Lebanese central government: 1970's until 2010

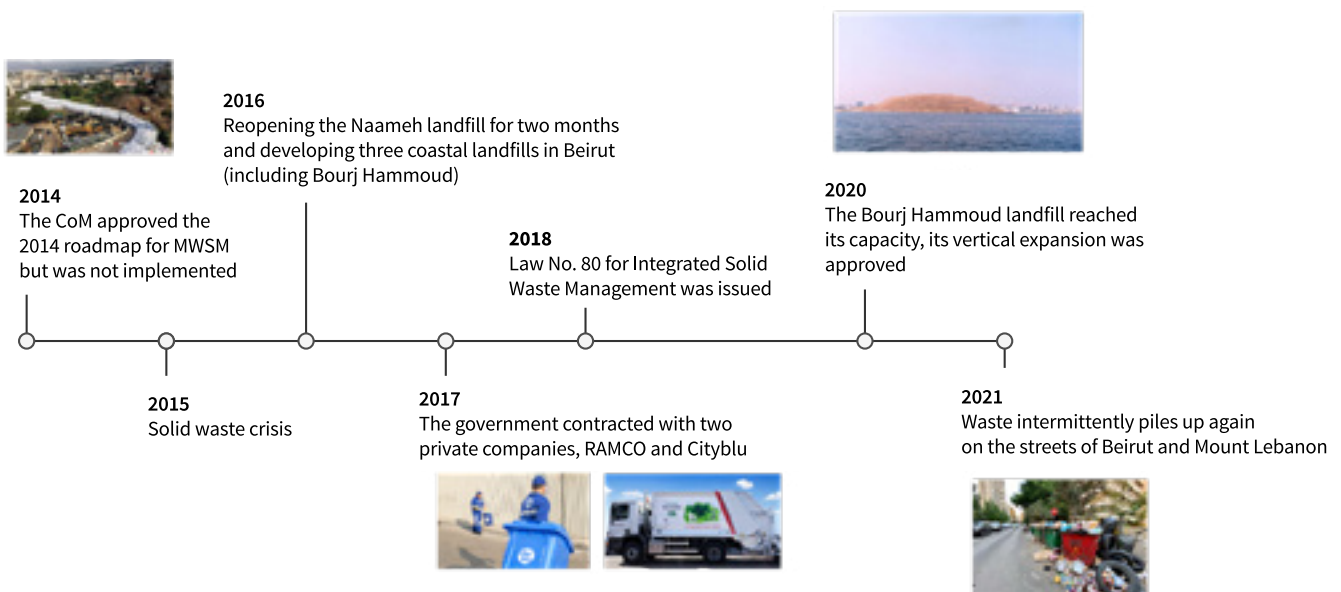


Figure 3: A timeline of environmental policies by the Lebanese central government: 2014 until 2021

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While laws were ratified and plans were drafted, failure of implementation is a consistent pattern. Short-term crisis responses which are supposed to be temporary - until a longer-term solution is designed - eventually turn into long-term plans which lead to another crisis. What is behind this pattern? Why do the different governments keep falling into the same “trap”? What makes the solid waste issue in Lebanon a chronic problem?

### 1.2. A failed but resilient system

The word “resilience” is frequently used in Lebanon as a positive term, yet this is not necessarily the case, especially when discussing the Lebanese political system. As explained by Walker et al. (2002) “Resilience is not necessarily desirable. System configurations that decrease social welfare, such as polluted water supplies or dictatorships, can be highly resistant to change”. Indeed, the Lebanese political system has proven to be resilient since it has the capacity to undergo multiple crises and always finds a way to self-organize and adapt to shocks, and it sometimes even learns and improves then goes back to its original behavior. Resilience is one of the characteristics observed in the solid waste system and that made it a chronic issue. This resilience is better understood by studying the underlying structure of the system that is governed by what is called feedback loops in the language of complex systems and systems thinking.

### 1.3. Systems analysis of the solid waste sector in Lebanon

The series of crises shown in the timelines of Figure 2 and Figure 3 represent the symptoms of a core chronic problem, which manifests from a complex system<sup>18</sup>. The Lebanese SWM system is complex since it involves many policy actors (government, private sector, civil society) and many authorities (central government, CDR, local authorities) and is exacerbated through the post-war power-sharing system. What is more, this complexity is multiplied through the ‘politics of muhassassa’ (quotas)<sup>19</sup>, by which political decisions are based on splitting the pie between politicians, according to certain quotas underpinned by the Ta’if and confessionalism. The outcome is a chronic inability to develop and implement evidence-informed policies, plans, and projects, yielding a failed state.

<sup>18</sup> [Kavulya et al. \(2012\)](#)

<sup>19</sup> [Reinoud Leenders](#)

#### 1.3.1. Methodology: systems thinking

**Systems thinking** is an approach that employs tools enabling users to analyze a complex problem from a systems lens while using a holistic or “bird’s eye” perspective. To address a chronic or problematic behavior, the system’s underlying structure needs to be understood and analyzed. As such, the problem’s elements and their interconnections can be identified - these constitute the structure of the problem. This is important to depict the feedback loops which are the mechanisms driving the problematic behavior of the chronic problem.

##### What is systems thinking?

To better understand what systems thinking is, the term “system” needs to be defined. A system is a set of elements that are interconnected in a way to achieve a purpose or a goal. The three core components of a system are: elements, interconnections and purpose. If one is missing from the studied subject, then it is not considered a system.

##### What does “complex” mean?

Complex does not mean complicated. A complicated problem is one that is difficult to solve and usually has a technical solution. The complexity of a problem or a system is a characteristic that depends on the number of components and their interconnections. The more components and interconnections there are, the more complex the system is.

##### What is a feedback loop?

A feedback loop consists of a set of elements that are linked through cause-and-effect relationships in such a way that creates a closed ring of causal influences. Loops are the major driving force of a complex system’s behavior. To understand where we need to intervene in a complex system, we need to map these feedback loops, analyze them and identify leverage points for interventions.

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Figure 4 shows a Causal Loop Diagram (CLD) of the Lebanese political system depicting the structure behind the decision-making mechanism in Lebanese public sectors. A CLD is a tool that represents closed loops of cause-effect linkages (causal links) as a diagram intended to capture how the system

variables interrelate. Subsequently, it would be possible to identify and label feedback loops to facilitate the analysis of complex systems. To facilitate the analysis of the CLD, each loop will be explained separately and then synthesized in the sub-sections that follow.

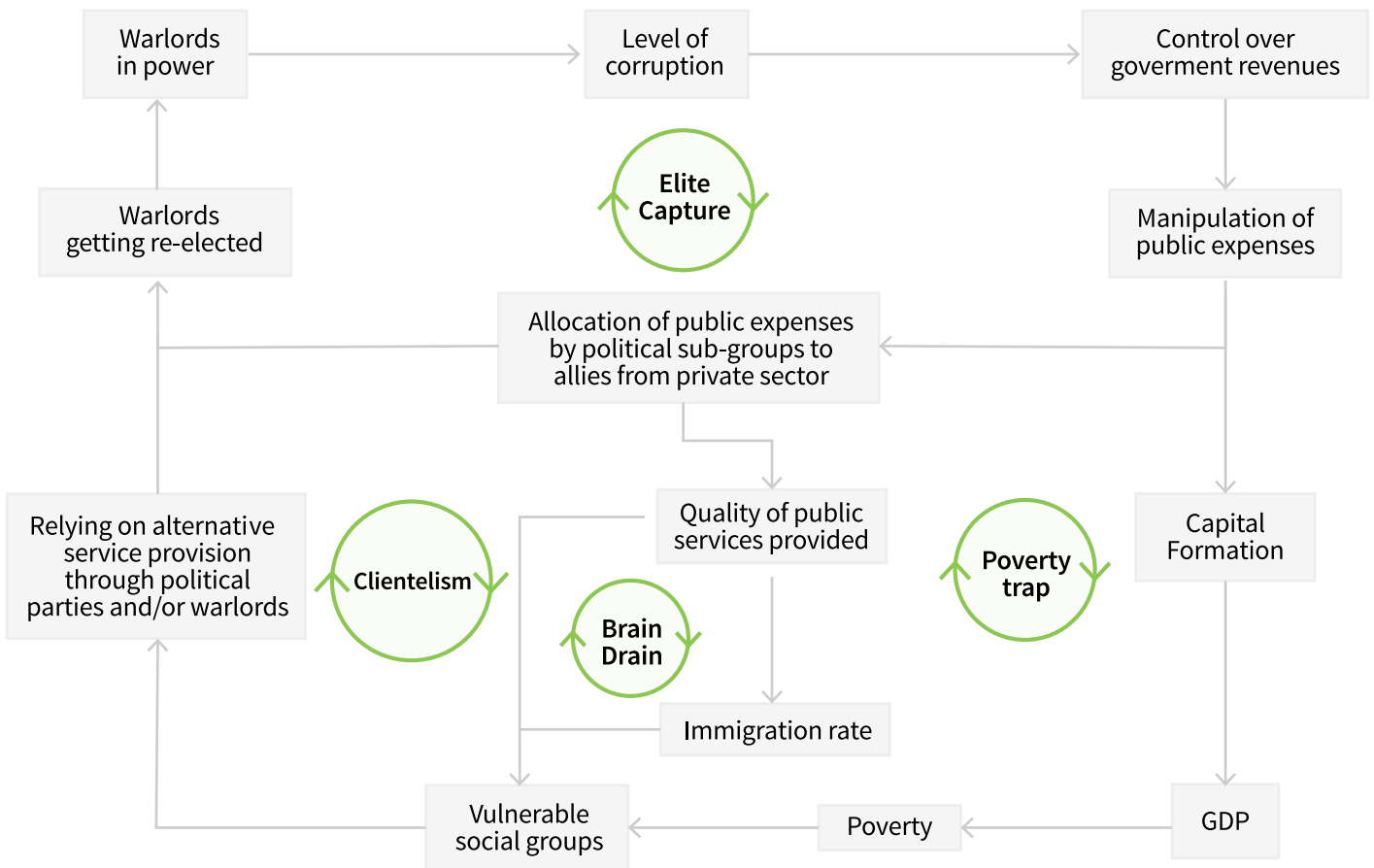
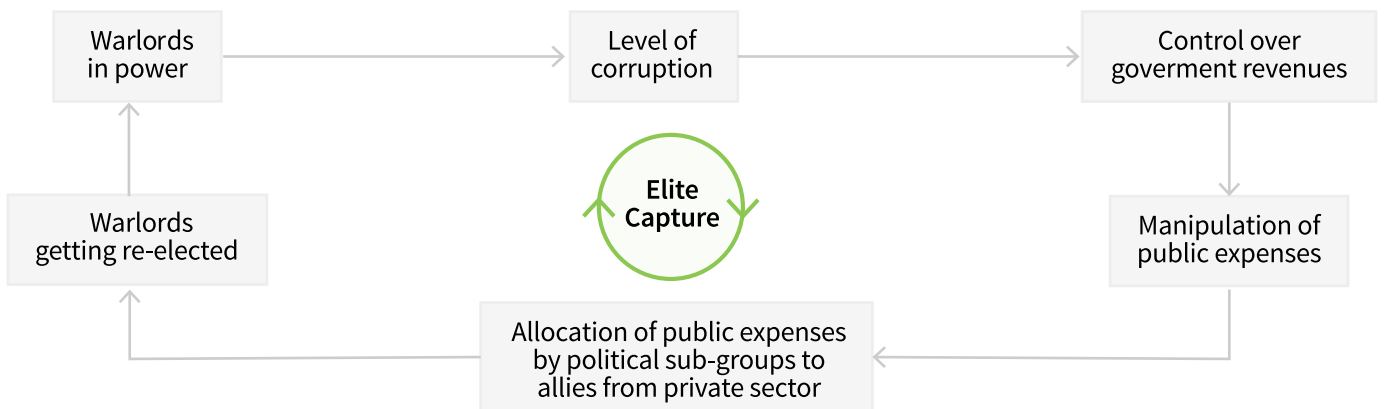


Figure 4: Causal Loop Diagram showing a generic structure of the Lebanese political system<sup>20</sup>

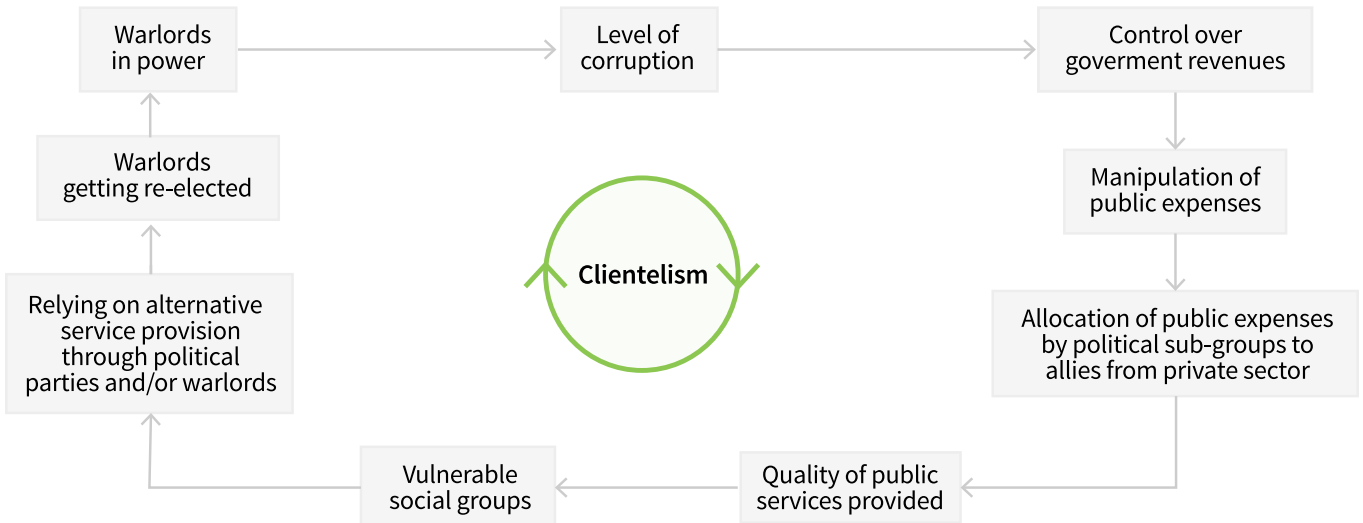


<sup>20</sup> Adapted from Queiroz (2015)

## 05 Unpacking solid waste management policies in Lebanon:

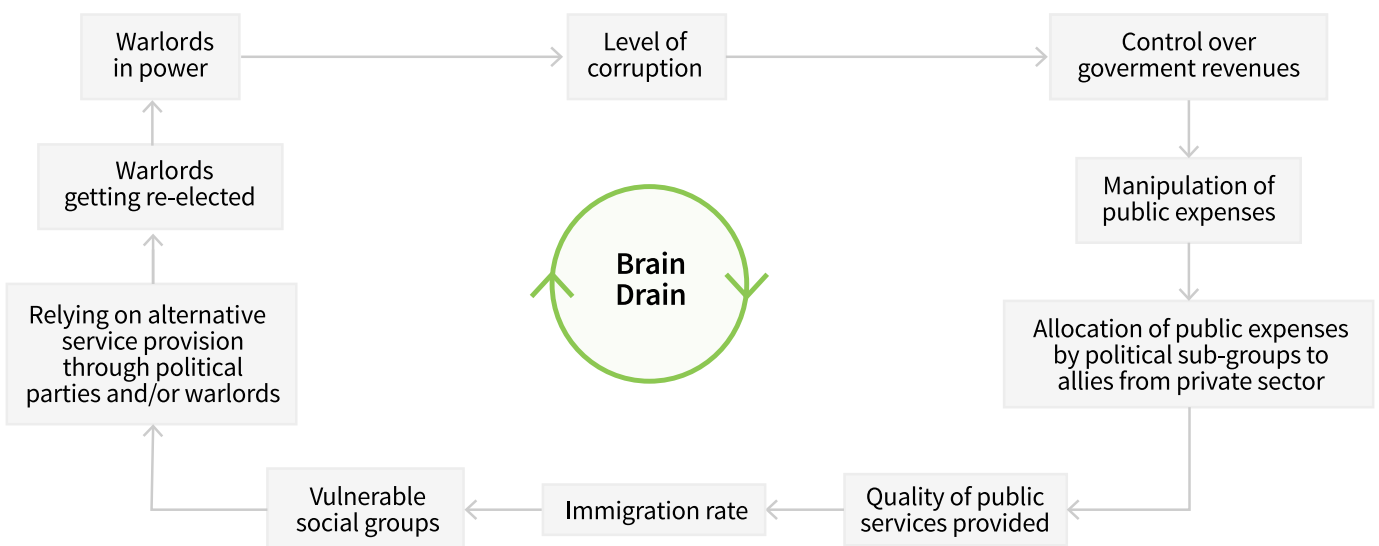
The feedback loop above shows elite capture as one of the loops that govern the Lebanese political system. Starting with the warlords who facilitate and allow corruption to seep into all public institutions. As such, as long as these warlords are in power, the level of corruption increases, which allows for control over government revenues and hence increases the possibility to manipulate public expenses. This means that

the allocation of public expenses is distributed by political parties to their partisans and allies from the private sector instead of following regulated public procurement laws. In return, the beneficiaries support the political campaigns of the warlords that facilitated their contracts thus ensuring their re-election.



Some common causal linkages with the elite capture loop exist also in the clientelism loop. Indeed, as long as the warlords are in power and as long as they can manipulate public expenses, the quality of public services provided by public institutions will decrease since the funds are allocated based on favoritism, confessionalism and nepotism rather than public interest. This will increase the vulnerability of local communities which will push them to rely on the support of warlords and their allies through different channels (i.e., private sector generators, water provision through private

water tankers, solid waste collection via Sukleen, RAMCO and Cityblu, etc.) thus depriving them of their basic rights. As such, through this mechanism, these same warlords and political parties are depriving citizens of their basic rights that should otherwise be provided by public institutions. By doing so, they reinforce the citizens' dependency on alternative service provisions thus decreasing trust in the public sector and increasing the reliance on political parties and warlords which they keep supporting in the next elections out of fear.

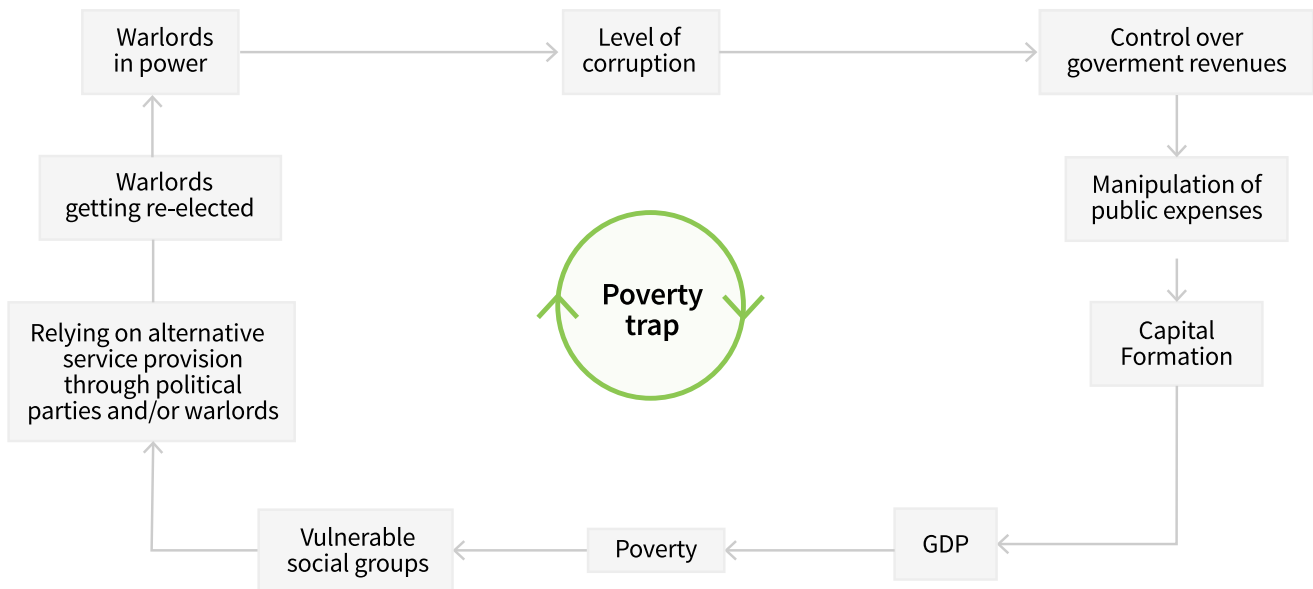




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The “brain drain loop” also shares common elements with the loops described previously. As long as the allocation of public expenses is based on nepotism, the quality of public services will be compromised, which will drive individuals who do not want to engage in clientelism out of the country in search of better living conditions. These are mostly the youth and the

working population who have the capacity to improve the situation of the country. Accordingly, only vulnerable groups that rely on alternative service provisions stay in the country. This again contributes to increasing the power of warlords and extending their mandates further.



The “poverty trap” loop shows how the manipulation of public expenses reduces investments thus decreasing capital formation which limits GDP (Gross Domestic Product) growth and increases the poverty level. This in turn increases the size of vulnerable social groups that rely on alternative service provisions from warlords and contributed to keeping them in power.

### Synthesis: the post-war political system as the root cause

All the above loops are vicious cycles that preserve the power of the post-war political elite group leveraging confessionalism and fear of the other to thrive. Whether willingly or unwillingly, the current ruling political class has either crafted or contributed to the survival of these mechanisms.

One of the root causes can be traced to the post-war Ta’if agreement, which resulted in the division of power amongst sects and corresponding political elites, generating a clientelist and corrupt public sector based on elite capture<sup>21</sup>. Indeed, political decision-making in Lebanon is shaped firstly, by the Ta’if agreement, which implies a confessional system that requires consensus between political elites on propositions, and (2) elite capture, which is reinforced by

political elites’ strong pursuit of private interests. As a result, decision-making in public sectors has become subject to negotiations and agreements between ruling elites, lacking transparency and plans or strategies to ensure financial and environmental sustainability. For the past three decades, politicians have continued to seek lucrative contracts that provide them with financial gains, rather than strategize for the common good of the nation. Additionally, the selective provision and uneven distribution of services and resources and recruitment based on nepotism have been adopted as re-electoral tools, producing a vicious circle between corruption and the persistence of the ruling class.

### How is this manifested in the solid waste sector and other public sectors?

The solid waste sector has been the victim of elite capture and clientelism since the early 1990s. In fact, in 1992 the Council for Development and Reconstruction (CDR) defied Decree 8735 of 1974 by taking jurisdiction of SWM from municipalities. The CDR inaugurated a centralized SWM sector, subject to agreements and negotiations between ruling elites. Public procurement in the sector became based on elite capture, lacking evidence-informed strategies and yielding ill-advised projects and contracts. Then in 2017, the government contracted with two private companies, RAMCO and Cityblu, to clean, collect, transport, and dispose

21 Ahmad & Al-Masri (2020)

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of solid waste in Beirut and Mount Lebanon<sup>22,23</sup>. Municipal governments, in Beirut and Mount Lebanon, contracted the private sector to provide alternative sustainable SWM strategies but were obliged to cover the fees of two contracts since the government is indebted to Sukleen; the contractor that provided this service before 2015 and that gets paid through the Independent Municipal Fund which lacks transparency and efficiency<sup>24</sup>.

The failure of public sectors and institutions in Lebanon is rooted in political decisions that were deliberately made to keep the elite capture and clientelism mechanisms running. Below are other examples showing how the structure described above is present across different public sectors and how political decisions inhibit the development of these sectors while fostering clientelism and elite capture.

### Electricity

According to the World Bank, Lebanon is ranked among the 30 worst countries in the quality of electricity supply. The energy sector is collapsing with power outages in different parts of the country exceeding 20 hours a day<sup>25</sup>. Additionally, it is the least profitable and second most costly in the Middle East and North Africa region<sup>26</sup>. Technical losses in power, often an indicator of poor infrastructure and lack of maintenance, sum up to 14%; while non-technical losses, attributed to corruption through theft, poor governance, weak law enforcement, and the use of public services as re-electoral tools (e.g., the selective provision of free electricity based on favoritism) are equivalent to 20%. This shows once more that there is no real intention to improve the electricity sector. A failed public energy provision keeps the alternative options viable and nowadays even indispensable. This generates high profits for the elite groups that support the current ruling class.

### Infrastructure

A report by the World Economic Forum<sup>27</sup> shows that, in 2019, Lebanon ranked 127th out of 141 economies on quality of road infrastructure. Moreover, Lebanon's public transport system is immensely inadequate. The public sector has been absent, operating only 35 buses in 2019. The aforementioned has allowed the emergence of an informal sector, consisting of 2,600 legally authorized buses and vans and 10,000 illegal buses, in addition to 33,000 legal and 20,000 illegal service taxis (in 2019<sup>28</sup>). Moreover, this increases the citizens'

reliance on private cars which incurs high charges on fuel, maintenance and turnover which means more cars bought an increase in custom tax revenues or even the possibility of custom tax evasion for the benefit of the political elite's clientele. For instance, employees who got their jobs through their affiliation to political parties that control the port's custom taxes<sup>29</sup> benefit greatly from this. All of these are channels that feed several clientelistic and elite groups that support the current ruling warlords.

### Water

Lebanon ranks 132nd out of 141 on reliability of water supply. Post-war reconstruction of the water sector has been based on privatization, underpinned by elite capture<sup>30</sup>. Due to the failure of the public water sector to evenly and adequately distribute its public resources, 25% of low-income households in Beirut paid more than 100\$ per month, in 2009, to purchase water from various sources<sup>31</sup>. Communities dissociated from patronage networks or political parties spent even more<sup>32</sup>. Furthermore, nepotism has been the fulcrum of recruitment in the sector, producing an overstuffed and underperforming administration. The said turmoil has placed around 71% of Lebanon's population at risk of losing access to safe water while ensuring a revenue stream for a network of private sector water providers<sup>33</sup>.

## 2. The Dysfunctions of the SWM System in Practice: Assessment of three municipalities

Municipalities in Lebanon were at the frontline of the solid waste crisis in 2015 and had to deal with the discarded piles of waste on their streets when the central government failed to find a solution. While some municipalities resorted to open dumping or burning, others saw an opportunity and decided to implement their own solid waste management system. Such interventions are part of the fundamental solution or an integrated solid waste management strategy. As important as these isolated interventions are, they are neither replicable nor scalable. Their life expectancy is short as long as the alternative solution is available, especially that the alternative is not mandatory, requires less effort, and is cheaper. This can

22 [The Daily Star](#)

23 [Business News](#)

24 [LCPS](#)

25 [The New Humanitarian](#)

26 [Ahmad & Al-Masri \(2020\)](#)

27 [World Economic Forum](#)

28 [Le Commerce du Levant](#)

29 [France24](#)

30 [Triangle](#)

31 [Triangle](#)

32 [Triangle](#)

33 [UNICEF](#)

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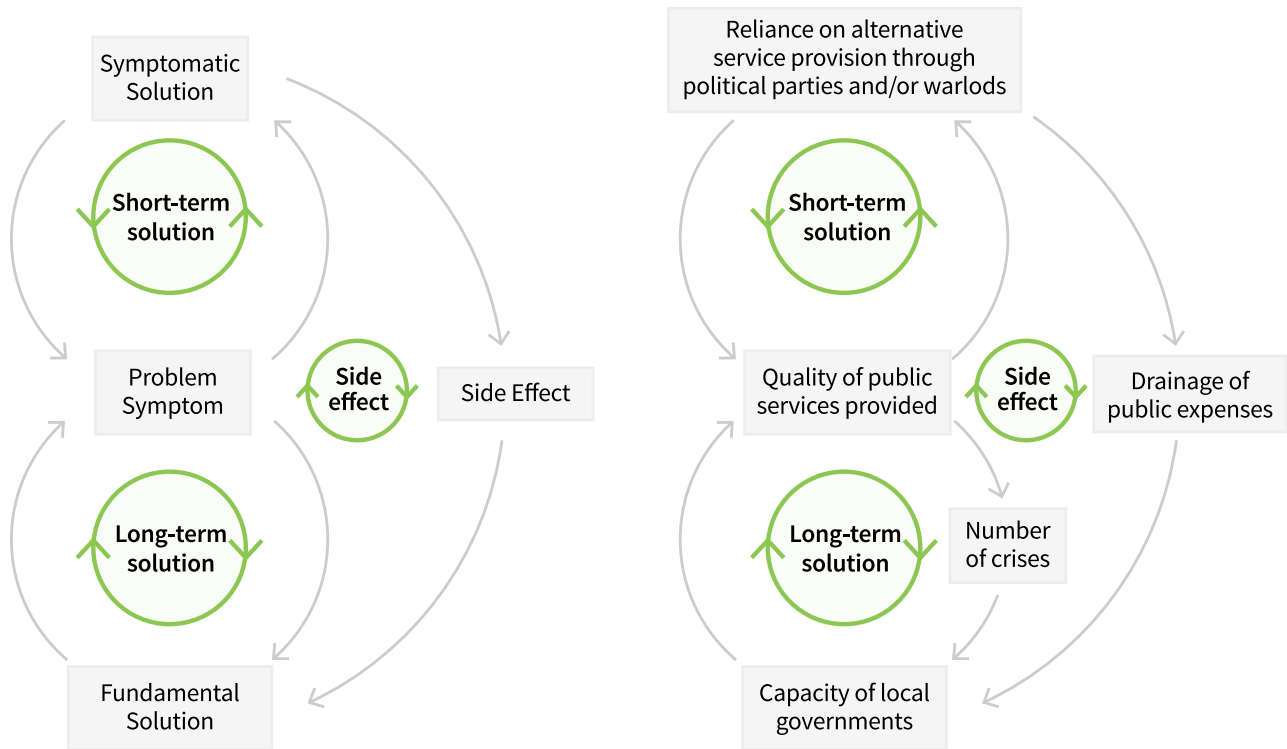


Figure 5: Shifting the burden archetype applied to the Lebanese political system - Adapted from Braun (2002)

be seen through the system archetype “shifting the burden” shown on the left side of Figure 5. Archetypes are generic system structures that support problem diagnosis in complex systems analysis<sup>34</sup>. The “shifting the burden” archetype is used to represent the structure of some interventions at the level of the variable “Quality of public services provided” in the CLD from Figure 4.

The “shifting the burden archetype” shows how short-term symptomatic solutions create an addiction due to their convenience and ease of implementation when compared to fundamental solutions. Fundamental solutions require long-term planning, bigger investments and a longer time to implement, and are thus avoided. One example of fundamental solutions in the solid waste sector would be to increase the capacity of local governments so they are capable of managing their own solid waste - capacity includes financial or human resources, as well as good governance and technical know-how. The alternative service provision through the contractor via the central government is a solution to the symptom of the problem. Figure 5 shows that as long as the alternative service provision by the central government is available, the quality of the public services will keep decreasing due to the manipulation of public expenses and their misallocation to services that do not serve the fundamental solution (loop labeled as “side effect” in Figure 5). As such, despite the efforts of some municipalities to intervene, as long as the required resources are not provided, their projects are bound to fail.

In light of the above, the experiences of three municipalities will be assessed following interviews that were conducted with the mayor of each town, these include Beit Mery, Dhour Choueir, and Brih<sup>35</sup>.

### 2.1. Beit Mery<sup>36</sup>

Beit Mery is a suburban town located in the Metn district, Mount Lebanon. It is 16 km away from Beirut and has a population of 17,000 and an area of 5.48 km<sup>2</sup>.

#### Beit Mery’s response to the 2015 SW crisis

In 2016, the Municipality of Beit Mery initiated a sustainable solid waste management strategy, designed and managed by Cedar Environmental, a private organization. The municipality has ever since been outsourcing solid waste management to the private sector and is not contracted with RAMCO.

The town is divided into four zones, with one collection truck assigned to each, providing door-to-door service with a fee of 30,000 LBP per household. The municipality

<sup>35</sup> The three municipalities were selected based on their interventions during a roundtable discussion organized by ARI and HBS between various municipal representatives, donor organizations, and NGOs that have been involved in alternative SWM strategies at grassroots levels, a multitude of challenges were raised and elaborated. The roundtable was held in November 2021.

<sup>36</sup> Data collected from an interview conducted by the authors with the Mayor of Beit Mery Mr. Roy Abou Chedid on December 9, 2021.

<sup>34</sup> Braun (2002)

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regularly conducts awareness campaigns to reinstate sorting requirements. Additionally, prior to the economic crisis, it used to distribute waste disposal bags to households. Compliance rates back then ranged between 50% and 60% and started decreasing after the provision of bags became unaffordable.

### Challenges faced

Following the economic crisis, the volume of produced waste decreased from 20 to 12 tons per day, impacting the company negatively (since it depends on higher volumes of waste to generate profit). Moreover, due to hyperinflation, the cost of treatment per ton is being re-evaluated, increasing from 500 million to two billion LBP per year. The municipality funded the project and continues to finance operations from its own revenues and not the Independent Municipal Fund. Additionally, the municipality still pays fees to offset its debt to Sukleen. Financial burdens are intensifying; and if municipal fees are not revised, there is a high risk of cessation of municipal operations. In addition to financial challenges pertaining to solid waste management in Beit Mery, non-compliance of many households with sorting requirements and the lack of effective enforcement hamper operations.

### Lesson learned: the problem is not technical

Despite the successful collaboration between Beit Mery's municipality and Cedar environmental, it is clear that the solid waste problem is not at the technical level. As long as the municipalities' resources are diverted to the companies contracted by the ruling elite (past and present), municipalities will not be able to keep their independent solid waste initiatives running.

## 2.2. Dhour Choueir<sup>37</sup>

Dhour Choueir is a village located in the Metn district, in Mount Lebanon, 27 km away from Beirut. Its population varies between 5500 and 7000 from winter to summer.

### Dhour Choueir's response to the 2015 SW crisis

During the waste crisis in 2015, two trucks were used to pick up recyclables and non-recyclables. They stored recyclables and then disposed of non-recyclables in a dumpsite. A sorting facility was established and accompanied by a big door-to-door campaign that was initiated in 2015. The municipality also submitted proposals for funds to buy bins for houses but did not get any funding for it. Instead, it was decided to place big bins on the streets, one for recyclables and another for other waste. The mayor estimated the compliance rate with

the sorting process to be around 30 to 40%. Eventually, it turned out that RAMCO, the currently contracted collection company, was mixing the waste from the bins and transporting most of it directly to the landfill and not to the sorting plants - only 20 to 30% of the trucks went to the sorting plants. When residents found out, they stopped sorting.

In parallel, two ministers (at the time) bought a batch incinerator, at their own expense, from the UK as a potential solution. However, the purchase of the facility was not well-researched and was ill-suited for the town. First, the incinerator's capacity was one ton per batch while the town produced five to seven tons of garbage per day. Relying on that system for SWM would have led to the accumulation of excess waste. Second, it lacked a pollution control system, scrubber, and a gas filter. Upon its announcement, the plan faced massive opposition, solidified by a social media outburst. In the meantime, the municipality installed the missing equipment (pollution control system, scrubber, and gas filter) and invited multiple institutions to carry out studies to enhance the system. After various attempts, the incinerator met MoE's standards. However, by that time, the government had resigned, and the work was discontinued.

### Challenges faced

The town is still contracted with RAMCO to handle its solid waste. Lebanon Waste Management (LWM), a sustainable solid waste management enterprise, also operates in the area, offering door-to-door pick-up services for recyclables. On a voluntary basis, 20% of residents are signed up with LWM and are sorting their waste. Despite the current mayor's intention to have a more sustainable approach to solid waste, he is incapable of implementing any other system due to lack of funding.

### Lesson learned: the problem is not technical

The case of Dhour Choueir is an example of the "shifting the burden" archetype showcasing the addiction to symptomatic solutions at both the government and citizens' levels. The procurement of an incinerator was based on a political decision, looking for an easy fix following the waste crisis in 2015. A proper assessment and design of an integrated solid waste strategy which supports longer-term and fundamental solutions would have prevented the failure of the initiative and the wasted investments on a symptomatic solution. At the citizens' level, the addiction to the current symptomatic solution - collection by RAMCO - is still preferred, despite the provision of a fundamental solution with LWM. The latter requires commitment from the citizens' side which cannot be guaranteed without the enforcement of relevant laws which requires political decision-making.

<sup>37</sup> Data collected from an interview conducted by the authors with the Mayor of Dhour Choueir Mr. Habib Moujaes on December 9, 2021.

## 2.3. Brih<sup>38</sup>

Brih is a small rural village (3.05 km<sup>2</sup>), encompassing almost 400 households and a population of around 1,500, located 53 km away from Beirut, in the Chouf district, Mount Lebanon.

### Brih's response to the 2015 SW crisis

Before the solid waste crisis in 2015, Brih did not have its own municipality and Sukleen was responsible for the collection and disposal of trash generated in Brih. After the termination of its contract with the CDR and cessation of its operations, trash accumulated in the small town's streets. A youth group, currently known as "Brih aam tefrouz" (literal translation: Brih is sorting), started a voluntary awareness campaign, advocating sorting from the source. Once the municipality was established in 2016, it joined their efforts and placed bins for three different types of waste on the streets: organic waste, recyclables, and untreatable waste. However, residents noticed that collection trucks had been combining garbage contained in the different bins in one haul. Therefore, incentives to proceed with sorting from the source decreased.

In 2017, the municipality decided to start a holistic, sustainable SWM plan. The local authority developed a survey and sent it out to residents to assess their needs and preferences regarding SWM and include them in local decision-making. Every step of the initiative's planning incorporated the community and was underpinned by its members' participation and perspectives. Residents were required to sort their garbage at home: (1) organic waste, (2) cardboards and paper, (3) plastics, glass, and metals, and (4) untreatable waste.

Organic waste is collected three times a week, cardboards and paper once a week, and plastics, glass, and metals once a week. Collection trucks pick up sorted garbage bags from residences' fronts. The municipality's trash pick-up service is offset by a fee of 10,000 LBP (was 5,000 LBP prior to the economic crisis), paid per household.

The municipality sells its recyclables and receives additional machinery that increases the efficiency of the facility from the Dutch Embassy. The facility also includes treatment of organic waste in a composting area that contains 21 pits to turn each batch of compost over each day for 21 days. Compliance of residents with sorting procedures fluctuates between 50% and 90%. Upon low compliance rates, the municipality carries out awareness campaigns. It does not use enforcement mechanisms to increase compliance. Often, a soft approach, based on close-knit relationships in the community and the fellowship between agents of the local

authority and residents, is used to pinpoint non-compliance.

Since the start of the initiative, the municipality has been handling solid waste operations on its own, without services provided by companies contracted with the CDR. In 2017, the Ministry of Interior and Municipalities sent a letter to all municipalities, giving them the option to opt out of the aforementioned services. The municipality of Brih submitted multiple letters to cede the contract and succeeded. To the author's knowledge, Brih is one of the very few municipalities that were able to terminate the contract. Additionally, the local authority calculated the actual amount of waste generated by its residents, which was around 800 kg/day. However, Sukleen was billing them 2 tons/day (2.5 times more than what they actually owed). The municipality submitted a request to reclaim its money and was able to retrieve it through the support of a major political figure.

### Challenges faced

The municipality faced multiple challenges whilst implementing and sustaining the initiative. Members of the municipal council had to take it upon themselves to gain technical expertise and knowledge that rendered them capable of implementing a SWM initiative, especially regarding the treatment of organic solid waste and the production of high-grade compost. They attended seminars and workshops and pursued training sessions by experts. Second, in light of the economic crisis, financial turmoil, and the surge in prices of fossil fuels in Lebanon, sustaining the operations (which are essentially underpinned by energy derived from fossil fuels) has been challenging. Moreover, the government has been absent in terms of technical and financial assistance. Hence, equipment that facilitated the process was only received around four years after the start of operations, as a donation from the Dutch Embassy.

### Lesson learned: the problem is not technical

An important factor that contributed to the success of Brih's facility was the intervention of a prominent political figure that supported the municipality to reclaim the fees that would have been otherwise disbursed to Sukleen. As such, without that political interference, Brih would not have the financial resources to implement and sustain its current system. The municipality also had to go the extra mile and acquire the needed technical expertise to design a successful system; a measure that should be provided by the relevant authorities at the central government. Nevertheless, the case of Brih ultimately shows that a committed decision by the municipality and its members to solve the SWM problem results in success. However, can the SWM sector rely on the voluntary commitment of municipalities? Or would the outcomes of this commitment only be materialized on a national scale when stipulated by regulations and enforced?

38 Data collected from an interview conducted by the authors with the Mayor of Brih Mr. Sobhi Lahoud on December 1, 2021.



## 2.4. Assessment<sup>39</sup>

Change can be initiated at local and municipal scales. Bottom-up initiatives have been playing a critical role in responding to solid waste crises, but how can their longevity be ensured? Is it possible to retain, sustain, and expand the reach of bottom-up initiatives to a national scale without comprehensive governance?

### 1. Municipalities are crippled by debt and financially drained.

Municipalities are still billed for solid waste management services provided by companies contracted with the CDR (Sukleen previously and RAMCO currently). Even if a municipality managed to develop and implement its own solid waste management scheme, it would not be able to opt out of aforementioned services and stop paying concomitant fees. This was stated by multiple municipal representatives during a roundtable discussion<sup>39</sup>, with the exception of one, which managed to cede paying aforementioned bills. Additionally, the economic crisis, high cost of fossil fuels, and power outages across the nation left municipalities struggling to sustain operations of their SWM facilities.

### 2. Municipal governments lack power and resources to enforce environmental regulations.

In parallel, two ministers (at the time) bought a batch incinerator, at their own expense, from the UK as a potential solution. However, the purchase of the facility was not well-researched and was ill-suited for the town. First, the incinerator's capacity was one ton per batch while the town produced five to seven tons of garbage per day. Relying on that system for SWM would have led to the accumulation of excess waste. Second, it lacked a pollution control system, scrubber, and a gas filter. Upon its announcement, the plan faced massive opposition, solidified by a social media outburst. In the meantime, the municipality installed the missing equipment (pollution control system, scrubber, and gas filter) and invited multiple institutions to carry out studies to enhance the system. After various attempts, the incinerator met MoE's standards. However, by that time, the government had resigned, and the work was discontinued.

### 3. Waste management requires cross-sectoral and transdisciplinary collaborations

The solid waste management sector is dependent on

<sup>39</sup> Data collected from a roundtable discussion organized by ARI and HBS between various municipal representatives, donor organizations, and NGOs that have been involved in alternative SWM strategies at grassroots levels, a multitude of challenges were raised and elaborated. The roundtable was held in November 2021.

other sectors such as energy (for powering treatment facilities), transportation (for waste collection mechanisms), development (land-use planning), and finance (budget allocation and financial support), among others. Additionally, in Lebanon's case, the problem transcends disciplinary boundaries, spanning the spheres of politics, engineering, environmental sciences, and urban planning. These intercalations render the SWM problem a convolution that could not be deciphered by concocting a narrow plan that only targets the technical parts of SWM operations. A broad range of expertise is required to find a holistic solution that effectively targets all aforementioned aspects of the solid waste problem in Lebanon.

### 4. There is no mechanism to hold municipalities accountable in the long run.

Municipal governments are also susceptible to corruption and manipulation of public resources. Financing grassroots initiatives is usually done by grants and donations from NGOs. However, this poses a major hurdle to holding municipalities that receive funding accountable, especially in the long run.

### 5. The continuity of implemented strategies is not ensured.

Since grassroots initiatives adopted or led by municipalities are not institutionalized, the continuity of the implemented SWM alternatives is not guaranteed - especially with the election of new municipal councils that have different agendas and priorities.

### 6. Implemented initiatives might not be replicable and/or scalable.

Replicability is defined by the extent to which an initiative can be implemented in a context, which is different from where it originated<sup>40</sup>. Scalability refers to the capacity of an intervention to change in scale - interventions are often scaled up (or expanded)<sup>41</sup>. In the following, we discuss replicability and scalability in terms of successful municipal initiatives.

Some local SWM success stories were backed by political parties, others by donors, or supported by the voluntary will of residents. These cases are not easily replicable as their enablers cannot be standardized across municipalities without governance: (1) funding from donors and political parties might not be regularly and sustainably secured, (2) authorities cannot expect voluntary compliance from residents without the enforcement of regulations, and (3)

<sup>40</sup> Schnell S., Brinkerhoff D. (2010) Replicability and Scaling Up. In: Anheier H.K., Toepler S. (eds) International Encyclopedia of Civil Society. Springer, New York, NY. [https://doi.org/10.1007/978-0-387-93996-4\\_596](https://doi.org/10.1007/978-0-387-93996-4_596)

<sup>41</sup> Schnell S., Brinkerhoff D. (2010) Replicability and Scaling Up. In: Anheier H.K., Toepler S. (eds) International Encyclopedia of Civil Society. Springer, New York, NY. [https://doi.org/10.1007/978-0-387-93996-4\\_596](https://doi.org/10.1007/978-0-387-93996-4_596)

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power advantages stemming from political parties' support of initiatives might not always be present. Moreover, success stories were mostly associated with small to medium scale towns. This might not be replicable in cities with larger populations, higher degrees of stakeholder multiplicity, and more formal dynamics between local authorities and residents.

The fragmentation of the municipal landscape impacts the scalability of interventions. In Lebanon, there are around 1,100 municipalities and municipal unions govern 6.8 M individuals; in contrast, Jordan has 100 municipalities corresponding to a population of 9 M. This fragmentation hinders efficient management of resources and the achievement of economies of scale. Another barrier to scaling up municipal interventions is the complexity of decision-making municipalities and unions, with the presence of multiple stakeholders, having diverse perspectives, needs, and concerns.

### 7. In light of the economic crisis, the urgency of solid waste management might not be perceived by multiple municipalities

A municipality representative mentioned that financial problems stemming from the economic crisis are overarching at the moment. Electricity supply is scarce, municipal opening hours are decreasing, and some municipalities are struggling to provide baseline operations. Therefore, to multiple municipalities, the urgency of the solid waste crisis is diluted and incentives to voluntarily initiate alternative SWM strategies are lacking.

## 3. SWM policy levers

With the current financial and economic collapse that Lebanon is going through, the country cannot afford another crisis in the solid waste sector. There is an urgent need to establish a SWM sector that is (1) environmentally and financially sustainable, (2) based on long-term planning for meeting international standards of waste management and ensuring the mitigation of crises, and (3) equipped with strong capabilities to respond to emergencies. To break or weaken the effect of the undesired “elite capture” and “clientelism” feedback loops previously described, interventions must be done endogenously; exogenous attempts at breaking such cycles either fail or have a short life expectancy; as was shown in the cases studies.

At the basis of all these levers, political decision-making remains the main enabler and pre-requisite that determines the success or failure of any policy at both the national and local levels.

### 3.1. The role of political decision-making in solid waste policies

The integration of financial and environmental sustainability is perfectly aligned with the concept of a circular economy, which is a framework that is “restorative and regenerative

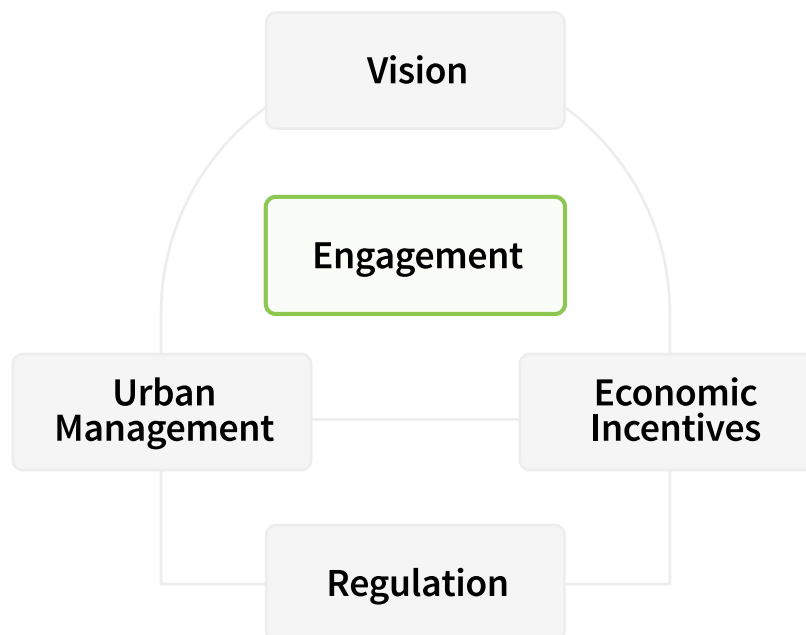


Figure 6: City Governments and their Role in Enabling a Circular Economy Transition – Source: The Ellen MacArthur Foundation

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by intention and design<sup>42</sup>. It is underpinned by three principles: (1) eliminate waste and pollution by design, (2) circulate the use of products and materials, and (3) regenerate natural systems<sup>43</sup>. This could yield an economy in which waste is viewed as a resource rather than a burden. The aforementioned should be a wake-up call for Lebanon to base its economic recovery (from the crippling economic crisis) around a green transition<sup>44</sup>.

The Ellen MacArthur foundation, a leading think tank in the circular economy field, developed a framework on the enablers and levers for successful circular policies that address solid waste issues (Figure 6).

Four out of the five enablers for a transition to a circular economy - vision, urban management, economic incentives and regulation - require political decision-making. As such, no matter how well developed the plans and the strategies are on a technical level, the lack of political support and decision-making will cripple any reform attempt in the solid waste sector. It is important to note that this does not imply that technical requirements should be undermined. Technical aspects of the solid waste system should still be

prioritized; however, they should not be the sole focus during policy design. Political considerations need to be equally incorporated to ensure successful implementation.

## 3.2. Levers in the Lebanese context

The current ministry of environment has been working on a new plan which calls for decentralization and empowerment of municipalities and unions, awareness-raising to implement sorting at source, recycling and composting facilities along with nine sanitary landfills<sup>45</sup>. Yet, in a recent public appearance, Minister of environment Nasser Yassin considered that the solid waste crisis is not merely an environmental issue. He discussed three main challenges when it comes to the implementation of the plan: the absence of the rule of law and good governance, lack of collaboration between the relevant ministries and local governments, and no accountability or punitive measures taken against environmental crimes<sup>46</sup>.

42 [Ellen MacArthur Foundation](#)

43 [Ellen MacArthur Foundation](#)

44 [Triangle](#)

45 [Lebanese Broadcasting Corporation International \(LBCI\)](#)

46 Seminar on environmental governance organized by the observatory of civil service and good governance, Université Saint Joseph, on February 10, 2022

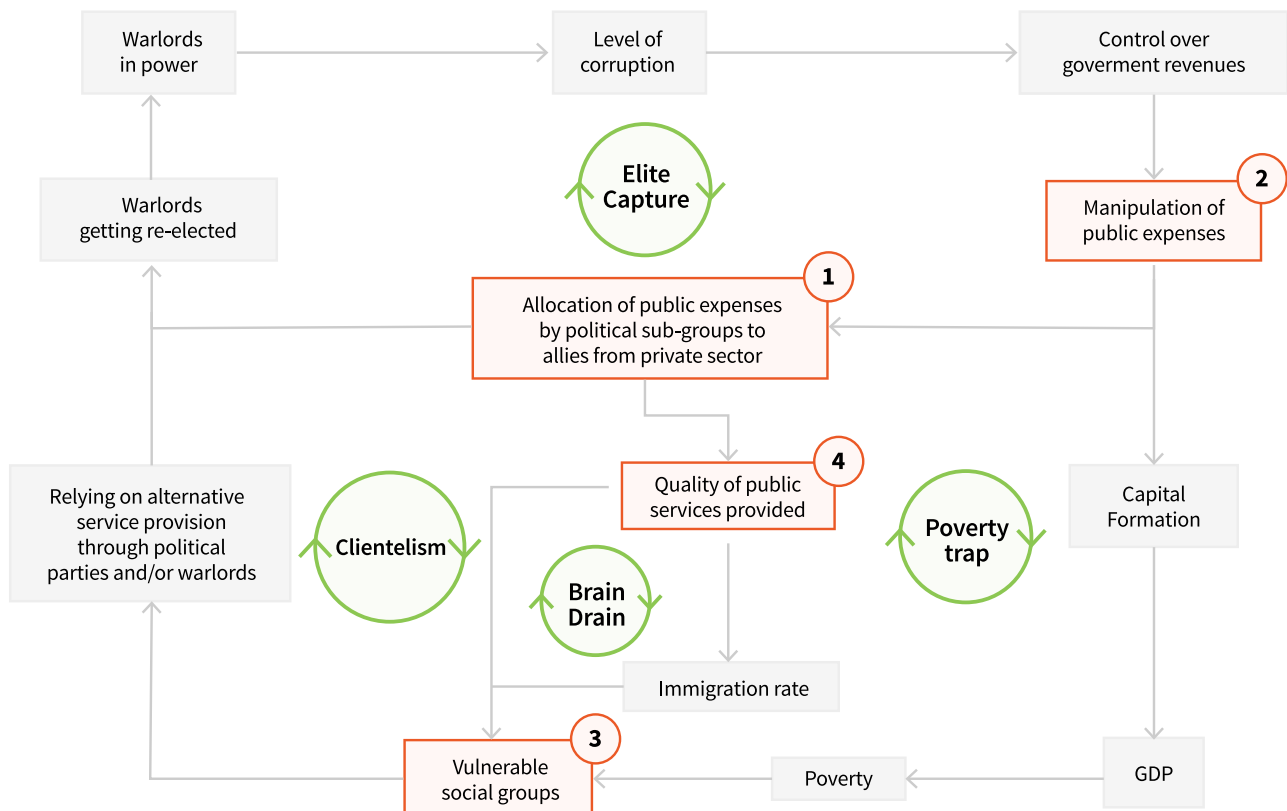


Figure 7: Causal Loop Diagram with location of potential interventions for the solid waste sector in Lebanon



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Building on the above and based on the systems analysis conducted, four key leverage points are presented to support identify where and how political decision-making can support the technical requirements for successful solid waste policy development.

### **Lever 1: Solid waste collection: no longer a profitable business for current contractors**

The “elite capture loop” showed how solid waste collection is one of the instruments that warlords and their private-sector allies created a vicious circle ensuring weak public service provision and leaving no choice but to rely on the private sector. However, due to the collapse of the Lebanese pound, this cycle is now breaking since solid waste collection is not profitable as a business to current private-sector contractors (i.e., RAMCO and Cityblu) due to the hyperinflation in running costs while the government is still paying them at the official rate.

### **Lever 2: Accountability, transparency and good governance are crucial while attention is turning towards decentralization and empowerment of local governments**

While attention is currently turning towards decentralization and empowerment of local governments, especially from the international community through funding of development projects, it is imperative that these projects be coupled with transparency and accountability requirements. Otherwise, the same structure observed in the causal loop diagram shown above will prevail but at a local scale. It is also crucial that municipalities receive capacity building on proper solid waste governance which focuses on the incorporation of resource recovery as a major revenue stream ensuring the viability of decentralized solid waste treatment systems.

### **Lever 3: The importance of inclusivity and participation**

The interviews showed that each town or village has unique socio-demographic characteristics. As such, adopting an inclusive and participatory approach whereby all stakeholder groups are included in the design of the solid waste management system is a prerequisite for successful

implementation. Studies have shown that a participatory approach not only allows the adaption of the designed policies to the context in which will be implemented, but it also creates a sense of ownership of the decisions made and reduces risks of policy resistance<sup>47</sup>.

With regards to inclusion, the empowerment of different social groups allows for a more efficient and effective implementation<sup>48</sup>. For example, women are the decision-makers when it comes to household management. Therefore, including them in the decision-making and dissemination of solid waste policies facilitates implementation. Another important group is informal waste recyclers<sup>49</sup>. Although seemingly counterintuitive, this stakeholder group alleviates the burden of solid waste collection. If these workers are given proper employment rights, their efforts could be leveraged and they would contribute to the solid waste collection process positively<sup>50,51</sup>.

### **Lever 4: Integration of the waste sector with other sectors**

To ensure maximum efficiency and reduce pressure on other sectors, it is also recommended to integrate policies designed with sectors beyond solid waste. For instance, integrating solid waste and renewable energy sectors - through waste-to-energy or any other renewable energy technology - allows for lower operating costs hence maximizing the resource recovery for municipal revenues and all the while reducing greenhouse gas emissions. Another opportunity is the integration of solid waste with the food production sector by including farmers in the solid management plan. Since farmers benefit from the output of composting (as organic fertilizers), then organic waste treatment stations can be organized in collaboration with them by utilizing their resources (lands, personnel, expertise, etc.) and offering them incentives. This would also be an opportunity to mitigate the risks of the NIMBY (Not in My Backyard) syndrome, since farms - especially herding farms - already process animal and agricultural waste.

47 Vennix (1996)

48 [Ministry of Environment](#)

49 [Democracy Reporting International](#)

50 [Issam Fares Institute for Public Policy and International Affairs](#)

51 [Deutsche Gesellschaft für Technische Zusammenarbeit \(GTZ\) GmbH](#)

## About Heinrich Böll Foundation

A catalyst for green visions and projects, a think tank for policy reform, and an international network, Heinrich Böll Foundation is affiliated with the German Green Party and promotes the development of democratic civil society at home and abroad. Its main tenets are ecology and sustainability, democracy and human rights, self-determination and justice.

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## About the Arab Reform Initiative

The Arab Reform Initiative is an independent Arab think tank working with expert partners in the Middle East and North Africa and beyond to articulate a home-grown agenda for democratic change and social justice. It conducts research and policy analysis and provides a platform for inspirational voices based on the principles of diversity, impartiality, and gender equality.

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