

### 3rd cycle UPR review Environmental Rights in Lebanon

1. Samar Khalil (Waste Management Coalition) and Roland Nassour (Save the Bisri Valley Campaign) have prepared this report as part of Lebanon's third-cycle review. The Arab NGO Network for Development endorses this submission.
2. Although previous UPR cycles for Lebanon omitted environment-related human rights, it is of utmost importance to address currently increasing pollution and environmental deterioration, and the governments' unwillingness to enact sensible policies.
3. Two central environmental policy issues concern Lebanon today: (1) Water management and dams, (2) solid-waste management.

#### **Solid Waste Management**

4. Sustainable access to natural and common resources, safe drinking water, sanitation facilities, refuse disposal, site drainage and emergency services are elements of the human rights to adequate housing and to health.<sup>i</sup> The human right to water also encompasses adequate sanitation.<sup>ii</sup> Since 1997, Lebanon has implemented emergency plans for solid-waste management. These plans are financially wasteful and give minimum attention to health and safety standards. Despite significant plans in 2006, 2010, 2014, 2015 and 2019 for integrated solid-waste management (ISWM), waste-to-energy and decentralization, a dichotomy persisted at the national level between the monopoly in Beirut and Mount Lebanon and its hinterlands, where all international aid finances Mechanical-Biological Treatment (MBT) plants with commingled waste collection, achieving low diversion rates from landfills and dumps.<sup>iii</sup>
5. All types of waste in Lebanon are mixed together, with only a small fraction of medical waste, treated separately. Adequate treatment is unavailable for waste produced by slaughterhouses, industries and some types of healthcare waste.<sup>iv</sup>
6. Solid waste management (SWM) in Lebanon has gained global attention since the 2015 "waste crisis", when one of the country's largest landfills at Naameh closed without an alternative plan, and the abrupt halt in waste collection led to waste piling up in the streets of Beirut and Mount Lebanon. This triggered months-long protests and heated debates around the need to re-organize the sector. Yet, the coverage of these events has overshadowed the SWM challenges faced by peri-urban areas and municipalities in ensuring public service delivery.<sup>v</sup>
7. Since the 2105 waste-collection crisis (during Lebanon's 2<sup>nd</sup> UPR), Lebanon has established an emergency plan for Beirut and Mount Lebanon, entailing the construction of two coastal landfills in Bourj Hammoud and Costa Brava, respectively. Environmental controversies have followed, including possible dumping in the Mediterranean Sea in violation of the Barcelona Convention, as well as open burning by some municipalities.<sup>vi</sup>
8. Central government executed the two landfills without completing an environmental impact assessment (EIA) as required by Decree 8633/2012 and despite several appeals and law suits.<sup>vii</sup> Garbage at the Costa Brava site, located near the airport, attracted birds that became a threat to aviation and public safety.<sup>viii</sup> At the Bourj Hammoud dump, a civil society group, Sohet Wledna Khatt Ahmar, issued videos showing trucks dumping garbage directly into the sea<sup>ix</sup> and local fishermen have protested the amount of garbage they were catching in their nets<sup>x</sup>. For 1½ years, those coastal landfills operated without

leachate treatment and sometimes without proper lining, which caused sea water pollution and severely affected the area fishermen. Around 550 families were threatened by the coastal landfill of Bourj-Hammoud/Jdeideh.<sup>xi</sup> Having reached its capacity, its expansion requires dumping in the fishing port and the port's relocation.<sup>xii</sup>

9. In Bourj Hammoud, the waste from the old sea dump, suspected to contain toxic waste that were shipped from Italy in 1987 during civil war<sup>xiii</sup>, was discharged into the sea without treatment. No government entity divulged monitoring results for leachate and sea water quality despite public requests. The National Center for Scientific Research (CNSR), whose mandate is to assess sea water quality and publish the data, did not reveal water quality near waste landfills. In 2018, CNSR published a study, where samples were taken regularly from 25 selected coastal locations, indicating that 16 were not polluted and suitable for swimming, four were fairly acceptable within World Health Organization (WHO) guidelines, and five were extremely polluted. The study excluded areas adjacent to factories, dump sites and sewage pipes. "These areas were left out because it is common knowledge that they are highly polluted," CNRS Secretary-General Mouin Hamze said<sup>xiv</sup>. CNRS' 2019 report included a graph measuring the level of heavy metals in marine sediments in some coastal areas. The findings showed that concentrations of cadmium, lead, copper and vanadium are higher than normal, sometimes much higher, as in the case of the area around the three landfills in Bourj Hammoud-Jdeideh.<sup>xv</sup>
10. People living around the coastal landfills were complaining of the foul smells that they had to endure daily. Between October 2017 and March 2018, AUB-NCC conducted a small-scale study on the environmental levels of hydrogen sulfide (H<sub>2</sub>S), one of the most prevalent and poisonous smell contributors at Bourj Hammoud. The H<sub>2</sub>S level detected (average of 51.0 µg/m<sup>3</sup> over a 10-day period) was 25 times higher than U.S. Environmental Protection Agency's safe limit for chronic exposure. Even more alarming is that 11 hospitals and medical centers and 32 schools and education centers are located less than 2 km away from that landfill, all of which are subjected to high H<sub>2</sub>S levels.<sup>xvi</sup>
11. On another front, Elard conducted a survey (2016–2017) on open waste dumps across Lebanon. The total number of identified dumpsites was 941, versus 670 in the 2011 survey.<sup>xvii</sup> The average total cost for rehabilitating these dumpsites is in the order of 74 million USD.
12. In December 2017, waste was being burnt at more than 150 open dumps, risking the health of nearby residents. Residents reported health problems, including chronic obstructive pulmonary disease, coughing, throat irritation, skin conditions and asthma symptoms. Air pollution from open waste burning has been linked to heart disease and emphysema, and can expose people to carcinogenic compounds. The practice violates Lebanon's obligations under international law, including the government's duties to respect, protect, and fulfill the right to health.<sup>xviii</sup>
13. During waste burning days, carcinogens in the air increase by at least 2,300%.<sup>xix</sup>
14. Open burning contributes around 410.5 g TEQ to the total release of PCDD/PCDF (26%), noting that more than 97% of PCDD/PCDF from this source group is released to air.<sup>xx</sup> These persistent organic pollutants can cause health effects including immune,

cardiac, respiratory, and reproductive health problems, genetic malformations, and cancers among others.

15. Lebanese municipalities are endangering the health of residents by openly burning waste, despite the national Integrated Solid Waste Management (ISWM) Law No. 80/2018 (24 September 2018), banning the practice and setting penalties for violations.<sup>xxi</sup>
16. In April 2019, due to the inability of the municipalities to pay the dump operator, a waste crisis emerged in North Lebanon after the closure of the Adoueh dumpsite, an unregulated dump used by the northern districts of Minieh-Dinnieh, Koura, Zgharta, and Bcharre for 17 years. Municipalities are responsible for collection, treatment, and disposal of their waste, and are supposed to receive their funding from an Independent Municipal Fund financed with taxes collected by the central government. However, disbursements to municipalities have been irregular and several years behind schedule.<sup>xxii</sup> To solve this problem, in August 2019, the Minister of Environment allocated a site in Terbol (North Lebanon) to be used as a landfill without conducting an EIA. The landfill met fierce opposition from local residents, with protesters citing concerns over its negative impact on health and the groundwater supply.<sup>xxiii</sup> An alternative site (al-Hawakir) was proposed, but also faced severe opposition from local residents and municipalities.<sup>xxiv</sup>
17. Due to the lack of planning, temporary quick fixes and mismanagement of existing solid waste-management facilities, the “Not In My Backyard” (NIMBY) syndrome increased across Lebanon and made people object to any SWM facility in their areas.
18. The ISWM Law (80/2018) gives the Ministry of Environment (MoE) an oversight and monitoring role for SWM and mandated the ministry to develop a national waste management strategy within six months<sup>xxv</sup>. MoE drafted a strategy and called concerned parties from the private, public, academic and civil society sectors to discuss it. Several concerns were raised about technologies proposed, related capacities and governance. Before the second meeting, MoE submitted a 10-year roadmap for SWM to the Council of Ministers claiming that it was based on the strategy (which was not finalized and was not subject to a strategic EIA as stipulated by the law).
19. On 27 August 2019, Lebanon’s Council of Ministers (CoM) approved a roadmap for SWM, which recommended expanding the Bourj Hammoud landfill in Beirut and included a map of 24 other proposed sites for sanitary landfills across the country, many of which are not backed by the required EIA studies. In at least one case, an assessment was conducted more than a decade ago. Under Lebanese law, the assessment is valid for only two years, after which the MoE must consider whether any changes on the ground call for a new assessment. The roadmap also included building two incinerators, one in the North and one in the South, in addition to facilitating the mission of the Municipality of Beirut to build an incinerator in the city. Environmental activists have long opposed waste incineration as a waste-treatment solution for Lebanon noting that the majority of waste can be either recycled or treated biologically. Activists question the government’s ability to properly operate and oversee management of such complex technology and treat its toxic by-products, in addition to its unaffordable cost to highly indebted Lebanon.

20. The decision approving the SWM roadmap, which will affect the country for the coming 25 years, with people bearing its financial, socio-economic, health and environmental consequences, was taken before finalizing the waste-management strategy and conducting a strategic EIA. No study determined: (1) whether the country really needs 25 landfills and 3 incinerators, (2) whether it can manage these incinerators, (3) whether the mostly organic waste composition is suitable for burning, (4) how the toxic fly ash would be managed, and (5) whether Lebanon can afford the cost of the construction, operation and maintenance of these incinerators. Other unanswered questions remain as well, such as: were the locations defined by service areas and in a participatory manner, and what are the environmental, health and socio-economic impacts of these decisions?
21. The CoM approved a Decree for the Management of Hazardous Waste not based on numbers or studies. It only mentioned a target for landfilling only 20% of the waste as a maximum, but the capacity of the existing sorting and composting centers was not determined, not even the capacity of the proposed incinerators and landfills, and the lifetime of the infrastructure to be used.
22. The Decree mentioned the approval of landfill sites and allowed for their immediate use, even though it mentioned preparing environmental studies for the projects. The decision is contradictory, noting that EIA studies require time and in-depth evaluation, which forbids the immediate use of the sites. This violates the laws (in particular Decree 8633/2012 for EIAs) and repeats the story of the Bourj Hammoud/ Jdeideh and Costa Brava landfills and the attempt to build the Terbol and Hawakir landfills in the North.
23. The locations of waste management facilities are usually determined based on scientific studies, but in Lebanon they are based on political decisions and reserved for political parties and corresponding sects. The CoM gave 15 days to the political parties to locate an incinerator in the South of Beirut.<sup>xxvi</sup> People's lives and health are left to political decisions and parties' interests.
24. The Decree approved the sorting of waste at source, which is an achievement despite its faults and the exclusion of hazardous waste. However, questions remain as to the application and the availability of financial and administrative tools and the infrastructure associated with its application, especially in light of the adoption of three incinerators. Their absorptive capacity was not specified and, if established according to what was proposed at the April 2018 Cedre Conference of international donors to support Lebanon —i.e., 1,200 tons per incinerator—these incinerators will require vast quantities of waste to feed them.
25. The CoM has approved Decree 5606/2019 for the Management of Hazardous Waste. This is also an achievement, but the plan did not include any infrastructure to manage this type of waste. This means continuing to adopt fragmented and unworkable solutions. If the hazardous waste remains mixed with household waste, this means that neither sorting, composting, burning, nor landfilling will be acceptable and that the environmental and health impacts are innumerable.
26. Although the central government made all of these decisions with emphasis on the application of administrative decentralization in waste management, the municipalities and their unions were not consulted, neither in the choice of waste management

solutions, nor on the specific locations of landfills and incinerators. Immediately after the end of the CoM meeting, some municipalities and their unions issued statements, expressing their categorical rejection of the adoption of incinerators and landfills in their areas (Annex 1). According to the ISWM Law, the MoE was given 6 months to issue a strategy and prepare a strategic environmental assessment for it. After the CoM approves the strategy, the municipalities should be given three months to present their plans to the MoE for study and approval. None of this happened; on the contrary, the Cabinet approved the roadmap on behalf of the decentralized units without consulting with them.

27. Two key dynamics underpin local SWM in Lebanon: The first is the emergence of a “new waste capitalism,” different from what has been observed in the 1990s.<sup>xxvii</sup> During that time, a so-called “waste capitalism” involved outsourcing waste collection and landfilling to politically connected businesses, ignoring local needs and demands. Since the 2015 “waste crisis”, complex technologies and treatment methods have been favored to include recycling, composting and waste-to-energy techniques. Recently advanced SWM solutions follow different business models with ambitious expenditures that have led to more-complex contractual relations between private service providers and local authorities. Due to the complex SWM technologies involved, local authorities frequently are unable to design, monitor and regulate the terms of the contracts awarded to private companies. A 2018 survey of 209 Lebanese municipalities found 36% outsourcing waste management to a private company, while 46% said they managed waste directly. This highlights the need to ensure accountability in the relationship of municipalities with the private sector to avoid further emergence of “new waste capitalism”. The second related issue refers to the limitations of Lebanese local authorities in managing solid waste. Since 2015, they are playing a bigger role in managing their waste, and are spearheading the construction of more-advanced treatment and disposal facilities. They are, however, unable to sustain these projects financially and operationally, especially given the low resources allocated to municipalities and the delay in the central government channeling those funds. Unsustainable facilities that are constructed at great cost result not only in a net capital loss for investors, but also the loss of local employment, along with the associated health and environmental costs. The financial consequences of such failures are eventually borne by the municipalities and the local taxpayers.<sup>xxviii</sup>
28. Some local authorities have conducted sensitization campaigns for citizens on issues such as at-source sorting and recycling, but most of them are unable to mainstream and institutionalize citizen participation in an inclusive SWM system. According to DRI’s survey, 39% of mayors consider, on average, that engaging with citizens on SWM issues is a challenge. This proportion is much higher (71%) in municipalities with more than 30,000 residents.<sup>xxix</sup>
29. Another waste crisis is foreseen soon with the coastal landfills reaching their capacity and without concrete actions and plans to create an integrated system for waste management to date. Lebanon is still dumping more than 90% of its waste, without an inefficient and operational infrastructure that can treat a large portion of its waste.

**Recommendations:** Lebanon’s Central Government should:

30. Formulate a strategy based on a baseline assessment of the quantities and types of waste, the current generation rates, the geographical distribution of this waste, and the forecasting of waste generation for the coming 10-15 years. The strategy should identify the needs (technical, financial, administrative and legislative) and gaps in the system and set targets for establishing an integrated waste management system that includes all types of waste.
31. Map existing SWM efforts and identify the geographic locations in which a treatment plant could be established in the context of rapid urbanization and limited available space. The strategy should identify various SWM technologies suitable to the Lebanese context, enshrine the pillars of the circular economy (reduce, reuse, recycle) as key strategic components, and establish regionalized waste management systems that achieve economies of scale by uniting several local authorities in broader service areas<sup>xxx</sup>
32. Mandate local authorities to develop their own master plan in line with the required national strategy, emphasizing waste reduction, which is at the top of the waste management hierarchy. The implementation of this principle requires economic policies that reduce and control the import of materials that can end in landfills and dumps, the use of financial, legal and educational tools for citizens, and working with industries to reduce the use of packaging materials and single-use products that are harmful to the environment. This principle also relies on encouraging the reuse and repair of materials, creating markets for used materials, and encouraging lease-to-purchase and other conservationist operations.
33. Reduce the environmental damage resulting from poor waste management (especially dumpsites and sanitary landfills, open burning, and poor management of sorting and composting plants) and the resulting negative health impacts. Proper monitoring and enforcement of legislation related to open dumping and burning should be applied.
34. Rehabilitate existing dumpsites according to technical specifications determined by the MoE using appropriate technologies.
35. Develop and adopt legislation related to sanitary and hazardous-waste landfills, providing specifications for their establishment and operation.
36. Establish a system for licensing SWM facilities after preparing environmental, health, social and economic impact assessment studies.
37. Establish a system for regularly inspecting and monitoring existing installations, and building a publicly accessible database showing the results of the monitoring program.
38. Immediately implement at-source waste sorting and a system for the separate collection of waste. In this context, it is possible to make benefit of the existing informal sector, which works on collecting separated waste and selling it to the specialized factories.
39. Set specifications for collecting, transporting and managing waste types of all kinds and mechanisms for licensing and controlling them.
40. Set standards for economic feasibility studies and assessing the environmental and social impact of all waste management facilities and technologies.
41. Develop emergency plans for waste management infrastructure.
42. Urgently task MoE with monitoring compliance with the ISWM Law, ensuring that violators are appropriately penalized and cases are referred to the relevant

environmental public prosecutors. The CoM should consider MoE budget allocations to ensure it can carry out monitoring and ensure effective remedy to everyone in Lebanon who suffers a violation of her/his human rights to health and adequate housing through commission or omission by state bodies<sup>xxxv</sup>

43. Center participatory processes on the principles of inclusivity and pluralism, involving stakeholders who have opposing views to act as a resource to generate innovation, create common understanding in local communities and ensure equal access to information and knowledge. This would desist from decades of top-down decision making in Lebanon, but implement participatory processes toward political and social consensus as citizens (not as sectarian adversaries), as institutions need to be committed to transparency and dedicate appropriate time and resources. In waste management, when participatory processes are used, they have the power to significantly reduce the NIMBY syndrome, and can result in the development of SWM facilities and infrastructure that are environmentally sound and socially accepted<sup>xxxvii</sup>
44. Developing an integrated and sustainable governance framework for SWM that includes cost-recovery schemes offering untapped opportunities to cover the heavy costs of SWM incurred by Lebanese local authorities. A sustainable SWM system requires the identification of a fair and equal tariff, whose calculation should consider affordability and the environmental and social costs of waste generation, rather than just the direct costs of the service<sup>xxxviii</sup>
45. Empower local authorities through a decentralization process that provides crucial services to their constituents. At the same time, it is imperative that the central government regulates the relationship between the private and public sector in the delivery of public services<sup>xxxix</sup>
46. Establish a central regulatory body with effective oversight that ensures compliance amid successful decentralization. Regulations should ensure government transparency in the creation, construction and maintenance of SWM facilities in which public and/or private entities are involved. It would adopt standard bidding criteria, technical terms of reference to evaluate service delivery, and model templates for SWM contracts that would improve SWM contracts and mitigate their negative effects on municipal budgets<sup>xxxv</sup>
47. Mandate local authorities to implement cost-recovery schemes dedicated specifically to SWM, thus safeguarding local authorities' autonomy to implement viable solutions in a decentralized context, while incentivizing waste reduction and at-source sorting<sup>xxxvi</sup>
48. Involve citizens and informal recycling actors to promote environmentally sound practices of the circular economy. The MoE and local authorities should organize policy dialogues and debates and involve CSOs and citizen groups in planning and implementing SWM projects, involving them in awareness-raising and sensitization campaigns about waste reduction, at-source separation and recycling. Informal waste collectors and recyclers should be registered and included in the SWM process<sup>xxxvii</sup>
49. Build capacity of local authorities in best SWM practices, awarding and managing service contracts sustainably<sup>xxxviii</sup>

50. Ensuring that any plan presented to the CoM comply with environmental and public-health best practices, as well as Lebanese and international law. Any plan should ensure that all authorities fulfill their treaty obligations to respect, protect and fulfill everyone's human rights to health, adequate housing, information and life in a safe and healthy environment.<sup>xxxix</sup>The CoM should not allow any waste-management project to be implemented without first ensuring that adequate EIAs have been carried out and adhered to.

## **Dams and Water Management**

51. Elements of the human rights to food and adequate housing include sustainable access to water, energy for cooking, heating and lighting and food storage. <sup>xl</sup>Everyone has a human right to water and health, requiring safe and potable water, while all these human rights impose corresponding governance obligations on the state.<sup>xli</sup>The National Water Sector Strategy (NWSS) developed by the Ministry of Energy and Water (MoEW) and approved in 2012 by the CoM stipulated building additional dams in order to counter water shortages. Consequently, dam construction resumed at an unprecedented pace: Three new dams were built in Qaisamani, Yammouneh and Mseilha, and five others are currently under construction, or in the final phase of commissioning at Bekaata, Balaa, Janna, Ain Dara and Bisri.
52. The NWSS lacks necessary baseline evidence: MoEW has not monitored rainfall nor surveyed the springs and aquifers since the 1960s<sup>xlii</sup> and has not conducted the required surveying and monitoring of groundwater extraction since 1970<sup>xliii</sup> leaving large gaps of information. The German Federal Institute for Natural Sciences and Resources (BGR) confirmed that MoEW's strategy for water is based on erroneous water balance figures and outdated studies<sup>xliv</sup>. The UNDP-conducted Assessment of the Groundwater Resources (2014) showed that Lebanon is not suffering from water deficit as claimed by MoEW. According to this study, the water budget shows clear surpluses, with groundwater being the main water resource in Lebanon, averaging 53% of yearly precipitation. However, aquifers are subject to mismanagement, with around 60,000 wells operating illegally across the country, leading to ineffective exploitation.<sup>xlv</sup>
53. According to Decree 8213/2012, a Strategic Environmental Assessment (SEA) is required for sectoral plans that have impact on the environment to ensure environmental concerns are fully included and addressed appropriately at the earliest stage of decision making. However, the SEA of the National Water Sector Strategy (NWSS) was not conducted until as late as 2015.<sup>xlvi</sup>The SEA recommended scaling-back the dams' program, considering its social, economic, and environmental constraints. For instance, the study described the Bisri Dam as "land greedy"<sup>xlvii</sup> and criticized its unrealistic amount of resource exploitation. The assessment classifies the proposed dam projects as "highest-regret" measures and suggests less risky and more-efficient alternatives. However, the SEA's recommendations were dismissed by the Ministry of Energy and Water.
54. Studies show that the current experience in dam building and management in Lebanon has proved to be inefficient and costly. <sup>xlviii</sup>The Brissa Dam in Donniyye, completed in



2013, failed to collect water due to its location on karstic limestone, allowing for a high rate of water infiltration<sup>xlix</sup>. The Qaisamani Dam, inaugurated in 2017, hasn't reached its full capacity yet, even after the heaviest rainy season Lebanon has known in a decade. The Balaa Dam, still under construction, is located on top of sinkholes and chasms, which has delayed the construction and caused additional costs for grouting and isolation<sup>l</sup>. Likewise, the Chabrouh Dam in Keserwan leaks more than 30,000 m<sup>3</sup> daily<sup>li</sup> and costs the government millions of dollars yearly for maintenance and repair. Finally, the Qaraoun Dam is extremely contaminated with heavy metals and cyanobacteria, which makes its water unsuitable for irrigation and domestic use.<sup>lii</sup>

55. Dam construction in Lebanon has been substantially harmful to the environment and to local communities. The Janna Dam caused irreversible damage to the Adonis Valley, which holds 70% of Lebanon's plant and animal species. The Qaysamani Dam was built atop the Shaghour Spring's catchment area<sup>liii</sup>, causing the deterioration of the spring's drinking water quality. The planned Bisri Dam will potentially destroy one of the most Lebanon's major landscapes, according to the National Physical Masterplan<sup>liv</sup>, devastating six million m<sup>3</sup> of forests and productive land and dismantling more than fifty archeological and historical sites. The dam is also planned to be built on an active seismic fault, posing risks of reservoir-induced earthquakes and risking the safety of many.<sup>lv</sup>
56. Violations of Decree 8633/2012 concerning the EIA:
  - a. The dams of Balaa, Beqaata and Mseilha were commissioned and/or implemented prior to completing an EIA Study.
  - b. The Janna Dam was commissioned in 2014 despite the expiry of the EIA study dating back to 2008 (EIAs are valid for only two years). At the request of the MoE, a new EIA study was conducted. Subsequently, the MoE reviewed the study and concluded that the project must be aborted. However, MoEW dismissed the MoE's decision and continued the construction.
  - c. Works on the Bisri Dam started in May 2019, despite the expiry of the EIA study that dated back to 2014. The MoE postponed its approval of the EIA until implementing the conditions stated in its review No. 652 / B of 5/6/2014, including the completion of the Ecological Compensation Plan. Until now, the Bisri Dam's EIA is incomplete and inconclusive, and lacks the approval of the MoE. Therefore, any constructions work constitutes a criminal offense according to Article 15 of Decree 8633/2012 attributed to Article 58 of the Environmental Protection Law No. 444/2002.
57. In 2019, the public outcry against the Bisri Dam project has grown significantly, and the protection of the Bisri Valey became one of the main demands of the 17 October protests. On 9 November 2019, protestors from all over Lebanon protested in the valley and opened the project's gates and barriers by force, pushing the contractor to withdraw its equipment off the site. Work that had started in May 2019 has since been postponed.

## Recommendations: The Central Government should:

58. Revise the NWSS according to a new baseline assessment of the national water balance, groundwater resources, snowmelt and rainfall, and other missing information. The government must identify the real water needs of the Lebanese population and conduct the necessary surveying and assessment of illegal groundwater extraction.
59. Large-scale projects of the NWSS must be suspended until the strategy complies with the requirements of the SEA.
60. The government should consider better alternatives for water and adopt low-risk and environmentally conscious water management that can guarantee water security, while avoiding devastating damage to the environment and local communities.
61. The government should abide by Lebanon's commitment to the Sustainable Development Goals (SDGs), notably 6, 13, 14 and 15, concerning the protection of water-related ecosystems, forests and agricultural land.
62. The MoE should strictly monitor the compliance of dam project with the requirements of the Decree 8633/2012 concerning the EIA.

<sup>i</sup> CESCR. (2000) GC No. 14: The right to the highest attainable standard of health E/C.12/2000/4, 11 August 2000, at:

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<sup>ii</sup> CESCR, GC No. 15: The right to water, E/C.12/2002/11, 20 January 2003, at:

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<sup>iii</sup> Azzi, E. (2017). *Waste Management Systems in Lebanon. The benefits of a waste crisis for improvement of practices*. Stockholm: KTH Royal Institute of Technology;

<sup>iv</sup> Abbas, I., Chaaban, J., Al-Rabaa, A.-R., & Shaar, A. (2017). Solid Waste Management in Lebanon: Challenges and Recommendations. *Journal of Environment and Waste Management*, 053–063;

<sup>v</sup> Democracy Reporting International, DRI. (2019b). *Solid Waste Management in Lebanon: Lessons for Decentralisation*. Beirut: DRI;

<sup>vi</sup> Arthur D Little. (2018). *The Lebanon municipal solid waste crisis and pathways forward. Insights into long-term solutions for the municipal solid waste crisis*. Beirut: Arthur D Little;

<sup>vii</sup> Human Rights Watch. (2017, November 10). Lebanon Needs a Long-Term Waste-Management Strategy. Beirut, Lebanon, at: <https://www.hrw.org/news/2017/11/10/lebanon-needs-long-term-waste-management-strategy>;

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<sup>viii</sup> Human Rights Watch. (2017, November 10). Lebanon Needs a Long-Term Waste-Management Strategy. Beirut, Lebanon, at: <https://www.hrw.org/news/2017/11/10/lebanon-needs-long-term-waste-management-strategy>;

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