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Draft Strategic Environmental and Social Assessment Report for Integrated Solid Waste Strategy

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Strategic Environmental and Social Assessment Study for Integrated Solid Waste Strategy

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Executive Summary

The Scope of the Strategic Environmental and Social Assessment (SESA) is to ensure that the **National Integrated Solid Waste Management Strategy (NISWMS) of Lebanon (2023)** is assessed from environmental and social aspects and necessary mitigation and monitoring activities are integrated in the proposed strategy in view of improving the sustainable development of solid waste sector in Lebanon. The SESA Report encompasses the following key sections:

1. Introduction,
2. Legal, Regulatory & Institutional Framework of Waste Management,
3. Description of National Integrated Solid Waste Management Strategy,
4. National Integrated Solid Waste Management Strategy Alternatives,
5. Environmental and Social Baseline,
6. Evaluating, Assessing and Addressing the Environmental and Social Impacts of the National Integrated Solid Waste Management Strategy,
7. Appraisal of the Capacities to Address Challenges,
8. Stakeholder Engagement,
9. Conclusion and Recommendations - Integration of SESA findings into the National Integrated Solid Waste Management Strategy.

<u>Legal, Regulatory & Institutional Framework of Waste Management</u>

The Government of Lebanon adopted Law No. 80/2018 on Integrated Solid Waste Management (ISWM), following the adoption of the ISWM policy in 2018 (CoM Decision 45 of 11 January 2018). Notwithstanding the importance of this milestone, some legislative reforms are still needed for the waste sector. They are further discussed under Strategic Objective 3, specifically in Sub-Objective 3.3.

Current legislation and regulations pertaining specifically to **waste management** include:

- Laws: 80/2018 (sets the framework for Integrated Solid Waste Management); 64/1988 (environmental protection against hazardous waste that could harm air, water, biodiversity, soil, and people);
- Legislative decrees: 7975/1931 (stipulates that solid waste should not be dumped randomly around residential areas but be removed and managed by the municipalities),
- Decrees: 5606/2019 (hazardous waste management); 5605/2019 (sorting at source); 13389/2004 (healthcare waste management) Decree 8735/1974 (protects against solid and liquid waste pollution and assigns waste collection and disposal to municipalities).
- MoE Decisions: 35 of 2024 (specifies the licensing procedures and principles for the facilities of recovery, and/or treatment, and/or final disposal of hazardous waste); 24/1, 25/1, 26/1, 27/1, 28/1, 29/1 and 30/1 of 2024 (specify the standards and conditions related to collection and transport, mechanical sorting, composting and biological disintegration, production of alternative fuels, thermal disintegration and management of the resulting ash, sanitary landfills, and non-hazardous sanitary landfill operation guidelines, respectively); 998/1 and 999/1 of 2019 and 59/1 of 2020 (specify the procedures and principles for hazardous waste generators, transporters and temporary storage facilities respectively); decision 58/2020 (classification of Reuse Derived Fuel "RDF" resulting from non-hazardous waste).
- MoE Memos: Memo 4/1 of 2022 setting for the municipalities, unions of municipalities, qaemaqams and governors, a tender document template for waste collection and transport.

Legislation related to **environmental safeguards** in Lebanon, include, in addition to law 444/2002 (environmental protection), decree 8213/2012 (Strategic Environmental Assessment), decree 8633/2012 (Environmental Impact Assessment), decree 8471/2012 (environmental compliance for establishments) among others. National environmental **standards** include decision 52/1 of 1996 (National Standards for Environmental Quality and the Environmental Limit Values for air, water, and noise), decision 8/1 of 2001 (National Standards for Environmental Quality - NSEQ), and decision 16/1 of 2022 (updated the ELVs for air emission sources figuring in decision 8/1 of 2001), Recommendations on the control of leachate are set out through IFC-WBG EHS Guidelines

Applicable **social** legislation include: The Labor Code of 1946 and its amendments; Expropriation law 58 of 1991 and its amendments; law 207 of 2000 prohibiting all forms of discrimination between men and women in the workplace; law 220 of 2000 stipulating the civil rights of people with disabilities; law 293 of 2014 protecting women and family members from domestic violence; law 205 of 2020 criminalizing sexual harassment at any location; as well as decree 11802 of 2004 regulating occupational health and safety, and decree 8987 of 2012 forbidding child labor in hazardous jobs.

In addition to the national legislative framework, Lebanon has also ratified several **conventions** related to the protection of the environment, natural and cultural heritage, and labor such as the Minamata Convention

(Mercury), UNFCCC, the Kyoto Protocol and Paris Agreement (Climate Change), Vienna Convention (Ozone), Stockholm and Basel Conventions (Persistent Organic Pollutants (POPs) and transboundary movement of hazardous waste), Convention on Biological Diversity (Biodiversity), Barcelona Convention (Protection of the Mediterranean Sea against pollution) and ILO Convention (Labor).

On the **strategic and planning aspect**, the most recent plans directly related to SWM include: the 2019-2030 Solid Waste Roadmap adopted in 2019, updated in 2020 (the Report of the Technical Committee formed by the CoM to support the Ministerial Committee in charge of studying SWM and in 2023 (ISWM Roadmap for 2023-2026), the Climate Action in the Solid Waste sector (2023), the Marine Litter Baseline (2021), and the 2017 update of the (2011) Master Plan for the Closure and Rehabilitation of Uncontrolled Dumps – noting that in May 2022, the CoM approved the sanitary landfills locations proposed by the MoE (Decision 67 of 20 May 2022). Other sectoral plans that can also impact the NISWMS include Lebanon's commitment to the UN sustainable development goals for 2030, Lebanon's Nationally Determined Contributions (of 2015 updated in 2020), Lebanon's national strategy for air quality management for 2015-2030, the integrated vision for the Lebanese industrial sector for 2025, the sustainable consumption and production national action plan, and others.

Primary governmental authorities and private actors in waste management and their responsibilities are outlined, the MoE being responsible for the preparation of national strategies, legislation, and standards, as well as the approval of local plans and environmental permits. The National Solid Waste Coordination Committee (NSWCC) coordinates issues pertaining to the solid waste sector, while the National Solid Waste Management Authority (NSWMA) should be in charge of preparing centralized projects and supervising their implementation; however, it has not been established yet. Local authorities are in charge of planning, implementing, and monitoring local waste management services; and private service providers are in charge of constructing and operating private or Public-Private solid waste projects. In addition, other transitional (CDR, OMSAR) and secondary (MoIM, MoI, MoPH, MoET, MoF, informal sector, private sector, NGOs and funding agencies) stakeholders play various roles in waste management.

With many interactions of different line ministries and a diversity of stakeholders in the sector, it is recommended to establish the National Solid Waste Management Authority, implement a Management Information System (MIS) and self-monitoring, and promote the inclusion of informal waste management operators in the formal sector.

<u>Environmental and Social Baseline Study</u>
The Report provides a comprehensive analysis of Lebanon's environmental and social baseline, encompassing the physical, socioeconomic, and biological environments, as well as solid waste management.

The physical environment section offers a detailed overview of the following: geography, location and topography; geology; soil characteristics; marine environment; surface water, groundwater, and hydrology; seismicity, climate and meteorology; climate change; land use/land cover and landscape and visual; acoustic environment; and atmospheric environment and air quality.

Starting with ***Lebanon's geography, location, and topography,*** the unique landscape influenced by natural systems extending beyond the country is emphasized. The section explains the current geomorphological matrix of Lebanon and how it is influenced by the historical ***geological*** events. As for the ***soil characteristics***, Lebanon has twelve soil types categorized depending on their composition and permeability. Erosion and mismanagement of these soils are resulting in significantly stressed Land Productivity Dynamics. The physicochemical characteristics and the biodiversity richness of the ***marine environment*** are also described. In terms of ***surface water, groundwater, and hydrogeology***, this section illustrates the thirteen rivers that cut through Lebanon with the main rivers being Litani, Assi, El Kebir, and Hasbani, and discusses the extent of water impairments in river systems and groundwater resources. Aspects related to ***seismicity, climate and meteorology***, as well as ***climate change*** are also covered. The four ***land use*** categories, namely, agricultural, urban, natural, and mixed rural areas are illustrated. ***Acoustic*** environment data was not available, unlike the ***atmospheric environment*** data; ***air quality*** components such as N02, 03, S02, PM2.5 and PM10 were compared and validated against values from the previously operational air quality monitoring stations. Lebanon's efforts towards addressing ozone depletion are also acknowledged. Lastly, odor problems associated with solid waste mismanagement are discussed. It is important to acknowledge some baseline gaps in acoustics, soil pollution, and marine environment. While conducting additional surveys could enhance the comprehensiveness of the baseline in these domains, it is important to note that such surveys are beyond the scope and budget of the current project.

Moving to the **socioeconomic environment**, the report explores the territorial administration; demography; employment and education; economic data and structure of the economic activity; balance of trade, productive sectors' characteristics; sites of cultural, historic and archaeological interest; poverty levels; inflation; grievances and controversies; potential threats; overview of the national social protection strategy; basic services and utilities; infrastructure; community health and healthcare system; and accidents and damages caused by natural hazards and manmade activities.

Lebanon's territorial administration, population and demographic characteristics sheds light on the distribution of the population by region and age group. Employment and education patterns and trends are also elaborated. The section discusses the economic characteristics of Lebanon, including the decreasing GDP, the evolution of the country's trade balance, and the main economic sectors, providing insights into the country's economic landscape. In addition to listing important sites of cultural, historical, and archaeological interest, the section also elaborates the effects of the socioeconomic crisis on poverty levels, the increasing inflation, the common grievances and controversies related to the political instability, as well as the current potential social threats including economic and political corruption and safety and security threats. An overview on the social protection system including Lebanon's social national plans are also highlighted. The current situation of the basic services and utilities and the current infrastructure situation in terms of electricity, water, and wastewater is explained and analysed. Concerns related to the healthcare system and hospitals' distribution is also overviewed. Lastly, accidents and damages caused by natural hazards and manmade activities included the Beirut port blast, forest fires, and the different sources of pollution.

The **biological environment** section overviews the following: ecosystems and ecological environment; flora and vegetation; fauna and avifauna including migratory pathways and patterns; protected and/or designated conservation species; protected and/or designated conservation sites; sensitive sites; and existing threats and pressures.

The section goes through the diverse ***terrestrial and marine ecosystems*** present in the country, illustrating the Key Biodiversity Areas. ***Flora and fauna*** species present on the IUCN red list for threatened species are listed. Lebanon's actions to promote the conservation of all floral and faunal species include various conventions, laws, and decisions. Protected and/or designated conservation sites are grouped by nature reserves, nature sites, biosphere reserves, Ramsar sites, Important Bird Areas, protected areas under the Barcelona convention, and marine protected areas. Sensitive sites are illustrated in a high priority sites map. The section highlights the ***significance*** of Lebanon's biodiversity, particularly its role in supporting human livelihoods and the country's economy. Additionally, the section delves into the existing ***threats and pressures*** on the environment, including habitat fragmentation and degradation, overexploitation of natural resources, and pollution, underscoring the challenges faced in preserving Lebanon's natural ecosystems.

Finally, a comprehensive overview highlights the current state of **solid waste management** in Lebanon, in line with the updated draft NISWMS, including the waste ***generation and composition*** and how they got impacted by the socio-economic crisis. Numerical figures of other ***waste types*** such as healthcare waste, electronic waste, and others are documented. SWM facilities are illustrated along the status of existing treatment and sanitary landfilling facilities. Numbers and volumes of operational, non-operational and inaccessible MSW dumpsites are presented. CDW types and quantities and their dumpsites are also elaborated. Lastly, the section shows the contribution of the waste sector to the GHG emissions, with CH4 being the most common emitted GHG. The conclusion underlines the impacts of inappropriate disposal on public health through soil, water and air pollution.

National Integrated Solid Waste Management Strategy Alternatives

The SESA alternatives to the NISWMS are presented in the following Table.

<table>
<tr><th colspan="2">Strategic Objectives</th><th>A1: "Do Nothing"</th><th>A2: "Current WM System"</th><th>A3: NISWMS</th><th>A4: More Land Demanding</th><th>A5: Least Land Demanding</th></tr>
<tr><td rowspan="2">Infrastructure</td><td>Collection, Reuse and Recycling Practices</td><td rowspan="2">Assuming no changes in infrastructure, economics or people's attitudes and priorities, and governance, the current waste management system is expected to continue unchanged, relying only on what is in place at the moment.</td><td>Minimum Separate Collection of Waste Materials, Reuse and Recycling</td><td colspan="3">Separate Collection of Waste Materials, Reuse, Recycling and Material Recovery Measures</td></tr>
<tr><td>Treatment Practices</td><td>Minimum Commingled Municipal Waste Mechanical Biological Treatment (Material Recovery, Energy Recovery (Waste-Derived Fuel Production, Anaerobic Digestion/ Composting))</td><td>Commingled Municipal Waste Mechanical Biological Treatment (Material Recovery, Energy Recovery (Waste-Derived Fuel Production, Anaerobic Digestion and/or Composting))</td><td>Commingled Municipal Waste Mechanical Biological Treatment (Material Recovery, Energy Recovery (Anaerobic Digestion and/or Composting))</td><td>Commingled Municipal Waste Mechanical Biological Treatment (Material Recovery, Energy Recovery (Waste-Derived Fuel Production, Anaerobic Digestion and/or Composting))</td></tr>
</table>

						+Thermal Treatment *(Incineration)*
	Disposal Practices		Sanitary Landfills and Dumpsites (Commingled Municipal Waste and Residual Municipal Waste)	Sanitary Landfills *(Residual Waste)*	Sanitary Landfills *(Residual Waste)*	Sanitary Landfills *(Residual Waste)* + Sanitary Landfills (Incineration Residuals)
Community and Private Sector Stewardship			Gradually increasing	Effective Community & Private Sector Engagement		
Governance			Gradually increasing	Effective Governance Framework Implementation		

The criteria for conducting the comparison and analysis of alternatives, included:

- Environmental & Climate criteria:
  - Pollution and toxicity: air quality; water quality; soil quality,
  - Ecosystems conservation: biodiversity,
  - Protection of cultural heritage,
  - Climate considerations: GHG emissions.
- Geographical criteria: geographical constraints, space requirement/ land availability
- Economic criteria:
  - Resource efficiency: (percent) recovery of resources; land intake (diversion from final disposal),
  - CAPEX (including cost of land),
  - OPEX.
- Governance criteria (resources required to implement and oversee implementation)
- Social acceptance criteria

The alternatives scenarios were assessed against the various criteria, as well as for their contribution towards achieving the relevant environmental objectives. The scoring system was based on sustainability criteria ranging from -5 (very negative compared to current situation), 0 (not affected), to 5 (very positive compared to current situation).
The proposed updated National Integrated Solid Waste Management Strategy (NISWMS) (Scenario A3) scores highest overall on the selected set of criteria. The first two scenarios have negative scores on most criteria and are undesired and unsustainable. Scenarios A3, A4 and A5 all provide significant improvement in waste management practices and achieve sustainability goals but to varying extents. Scenario A5 is not viable in Lebanon given the current circumstances (public debt, economic and financial crisis, public opposition and mistrust, political indecision, weak governance, etc.) and its high CAPEX and OPEX. Scenario A4 requires more land than Scenarios A3 and A5 since it incurs landfilling a greater proportion of waste, knowing that land availability and landfill siting are problematic in Lebanon, and that landfilling constitutes a threat to water resources given Lebanon's geological formation. Consequently, Scenario A3 – the proposed NISWMS - stands as the preferred scenario and the immediate solution to the SWM crisis in Lebanon. This scenario comprises RDF production from non-recyclable rejects having a good calorific value, which further reduces the volume of rejects to be landfilled while also providing a source of energy for industries.
The proposed Strategy provides quick solutions to the waste crisis in Lebanon that can be adopted immediately to solve the pressing need for waste management solutions and infrastructure and stop open dumping. In parallel, recommendations to further promote circularity and ensure a circular economy on the longer term are being proposed since this concept requires further improvement and adaptation of the legal and policy framework, awareness, and attitudes, together with infrastructure adaptation that require a longer time span.

Environmental and Social Impact Assessment / Mitigation Measures

The potential environmental and social impacts are examined for the main environmental and social parameters that are relevant with the Strategic Objectives (SOs) and their specified Strategic Sub-Objectives (SSOs) proposed in the NISWMS. The main environmental and social parameters which are relevant with the SOs and SSOs of the NISWMS that are laying the groundwork for assessing any potential environmental and social impacts:

- Biodiversity/ Flora & Fauna,
- Air & Climatic Factors,
- Acoustic & Olfactory Environment – Noise & Odour,
- Water Resources,
- Soil,
- Land Use Material Assets,
- Landscape,
- Population – Socio Economic Environment,
- Human Health,

- Cultural Heritage.

The **Key Environmental Objectives** in relation to the environmental and social parameters are presented in the following Table.

Environmental & Social Parameters	Environmental Objective (EO)
Biodiversity/ Flora & Fauna	↘ **EO1A**: Protection, preservation and management of biodiversity and avoid loss of ecosystems and protected species.
Air & Climatic Factors	↘ **EO2A** Reduction of emissions of gas pollutants into the atmosphere. ↘ **EO2B** Minimization of greenhouse gas emissions. ↘ **EO2C** Energy and fuel savings and increase of RES exploitation.
Acoustic & Olfactory Environment	↘ **EO3A** Noise reduction and avoidance of exposure to environmental noise levels more than permissible limits. ↘ **EO3B** Reduction of levels and intensity of odours emitted.
Water Resources	↘ **EO4A** Maintaining and improving the quality of groundwater, marine and surface water and the disruption of the hydrographic network.
Soil	↘ **EO5A** Preservation of the quantity and quality of soils ↘ **EO5B** Reduction of soil pollution.
Land Use Material Assets	↘ **EO6A** Rational Land Use. ↘ **EO6B** Protection and upgrading of the value of real estate in the proposed intervention areas. ↘ **EO6C** Management, maintenance and efficient use of existing infrastructure as well as resources for the development of new infrastructure to prevent interventions into assets.
Landscape	↘ **EO7A** Avoid landscape fragmentation during implementation of activities. ↘ **EO7B** Minimizing the negative impacts on the natural, man-made and cultural landscape and if possible, upgrading the aesthetics of the landscape through the implementation of activities.
Population – Socio Economic Environment	↘ **EO8A** Sustainable population growth. ↘ **EO8B** Improving conditions for access to public services. ↘ **EO8C** Improving access to work, education, shopping, services, leisure. ↘ **EO8D** Stimulation of productive activities related to interventions and expansion of economic activity.
Human Health	↘ **EO9A** Improving quality of life. ↘ **EO9B** Reduction of gas pollutants and noise emissions which in turn have a negative impact on human health.
Cultural Heritage	↘ **EO10A** Preservation, protection and promotion of historic buildings, archaeological sites and other sites of cultural interest.

The correlation between the above mentioned EOs and SOs and SSOs of the NISWMS is presented below:

Environmental & Social Parameters	EO	Strategic Objectives												
		SO1				SO2				SO3				
		SSO 1.1	SSO 1.2	SSO 1.3	SSO 1.4	SSO 2.1	SSO 2.2	SSO 2.3	SSO 2.4	SSO 3.1	SSO 3.2	SSO 3.3	SSO 3.4	SSO 3.5
Biodiversity – Flora – Fauna	EO1A													
Air & Climatic Factors	EO2A													
	EO2B													
	EO2C													
Acoustic & Olfactory Environment – Noise & Odor	EO3A													
	EO3B													
Water Resources	EO4A													
Soil	EO5A													
	EO5B													
Land Use & Material Assets	EO6A													
	EO6B													
	EO6C													
Landscape	EO7A													
	EO7B													
Population – Socio Economic Environment	EO8A													
	EO8B													

Environmental & Social Parameters	EO	Strategic Objectives												
		S01				S02				S03				
		SSO 1.1	SSO 1.2	SSO 1.3	SSO 1.4	SSO 2.1	SSO 2.2	SSO 2.3	SSO 2.4	SSO 3.1	SSO 3.2	SSO 3.3	SSO 3.4	SSO 3.5
	E08C													
	E08D													
Human Health	E09A													
	E09B													
Cultural Heritage	E10A													

Legend:

Correlation	Compatible	Incompatible	Uncertain Connection	No Connection
	Affecting the EO positively	Affecting the EO negatively	Affecting the EO positively and negatively	No connection

The potential environmental and social impacts of the implementation of the NISWMS are presented in the following Table. For the prevention, reduction and offset of the impacts on the various environmental and social parameters, basic guidelines / mitigation measures are proposed.

Strategic Sub-Objectives (SSOs) / E&S Parameter	Biodiversity / Flora & Fauna	Air & Climatic Factors	Acoustic & Olfactory Environment	Water Resources	Soil	Land Use & Material Assets	Landscape	Population – Socio Economic Environment - Human Health	Cultural Heritage	Overall by SSO proposed in the NISWMS
Strategic Objective 1: Complete, Upgrade and Operate ISWM Infrastructure										
SSO 1.1: Establish an Effective Waste Collection and Transportation System	+/–	+/–	+/–	+/–	+/–	+/–	+/–	+	0	
SSO 1.2: Establish Reuse, Recycling and Material Recovery Facilities for Separately Collected Waste	+/–	+/–	+/–	+/–	+/–	+/–	+/–	+	0	
SSO 1.3: Establish Climate-Smart Waste Treatment and Energy Recovery Facilities	+/–	+/–	+/–	+/–	+/–	+/–	+/–	+	0	
SSO 1.4: Establish Climate-Smart Final Disposal Facilities and Close/Rehabilitate Open Dumps	+/–	+/–	+/–	+/–	+/–	+/–	+/–	+	0	
Strategic Objective 2: Enhance Community and Private Sector Stewardship Towards a Circular Economy										
SSO 2.1: Engage Community in Waste Reduction and Sorting at Source	+	+	+	+	+	+	+	+	0	
SSO 2.2: Integrate the Informal Sector in the ISWM System	+	+	0	0	0	0	0	+	0	
SSO 2.3: Promote Private Sector Participation and Investment in Waste Management	+	+	+	+	+	+	+	+	0	
SSO 2.4: Enhance Public Awareness and Education	+	+	+	+	+	+	+	+	0	
Strategic Objective 3: Enable an Effective Governance Framework to Implement the ISWM System										
SSO 3.1: Establish and Operationalize the National Solid Waste Management Authority (NSWMA)	0	0	0	0	0	0	0	++	0	
SSO 3.2: Establish and Implement Cost Recovery System and the Extended Producer Responsibility (EPR)	0	0	0	0	0	0	0	++	0	
Sub-Objective 3.3: Complete and Enforce the Waste Management Legislative Framework	0	0	0	0	0	0	0	++	0	
Sub-Objective 3.4: Complete and Implement the Planning Framework at the National and Local Level	+	+	+	+	+	+	+	++	0	
Sub-Objective 3.5: Establish and Operationalize a Waste (incl. Hazardous Waste) Management Information System (WMIS)	0	0	0	0	+	+	0	++	0	

Legend:

- \- Negative Impact
- 0 Neutral Impact
- +/- Mixed Impact
- \+ Positive Impact

Environmental and Social Monitoring System

The proposed **Monitoring System** for the implementation of the NISWMS is presented below.

E&S Parameter	Proposed Indicators	Unit	Frequency
Biodiversity/ Flora & Fauna 	Protected areas (Nature Reserves, Natural Sites, Hima and Forests, etc.) occupied by the SW of NISWMS	m^2	↘ Prior to the construction of WM facilities ↘ Annually
	Changes in the ecological characteristics (conservation status, etc.) of significant habitats in the adjacent protected areas in case they are affected	m^2	↘ Prior to the construction of WM facilities ↘ During the 1st of operation of the WM facilities ↘ Every three years
Air & Climatic Factors 	Major pollutants affecting air quality from measures / infrastructural projects developed under the NISWMS	Appropriate parameters (SO_2, NO_2, etc.) depending on the case	↘ Prior to the construction of WM facilities ↘ Monthly during the 1st year of operation ↘ Annually, if no exceedances occur
	Changing greenhouse gas emissions from soft measures and SW of NISWMS	Appropriate parameters, depending on the case.	↘ Prior to the construction of WM facilities ↘ Monthly during the 1st year of operation ↘ Annually, if no exceedances occur
	Climatic trends including sea level rise and extreme weather events such as storms, floods, etc.	Qualitative	↘ Prior to the construction of WM facilities ↘ Annually
Acoustic & Olfactory Environment 	Noise levels generated at the SW Management Facilities and in the vicinity of them	dBA	↘ Prior to the construction phase of WM facilities ↘ During the 1st of operation ↘ Every three years, if no exceedances occur
	Population exposed to noise levels above the limit values due to measures / infrastructural projects developed under the NISWMS, in case they are affected	Population	↘ Annually
Water Resources 	Change in surface, groundwater and marine bodies' quality from measures / infrastructural projects developed under the NISWMS, in case they are affected	Appropriate physicochemical parameters, depending on the case	↘ Prior to the construction the WM facilities ↘ During the 1st of operation of the WM facilities ↘ Every three years, if no exceedances occur

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E&S Parameter	Proposed Indicators	Unit	Frequency
Soil 	Change in Soil quality (Ph, chemical indicators) from measures / infrastructural projects developed under the NISWMS, in case they are affected	Appropriate physicochemical parameters, depending on the case	↘ Prior to the construction of the WM facilities ↘ During the 1st year of operation of the WM facilities ↘ Every three years, if no exceedances occur
Land Use Material Assets 	Change in the value of assets in the surrounding area.	%	↘ Prior to the implementation of the NISWMS ↘ Annually
Landscape 	Change in the sustainability and attractiveness of the environment from measures / infrastructural projects developed under the NISWMS, in case they are affected	Qualitative	↘ Prior to the implementation of the NISWMS ↘ Annually
	Degree of landscape restoration /changes from the implementation of measures / infrastructural projects developed under the NISWMS	%	↘ Prior to the implementation of the NISWMS ↘ Annually
Population – Socio Economic – Human Health 	Jobs created because of the measures / infrastructural projects developed under the NISWMS	Number	↘ Prior to the implementation of the NISWMS ↘ Annually
	Exceedance of noise levels, water bodies and air quality limit values from the implementation of measures / infrastructural projects developed under the NISWMS	Appropriate parameters, depending on the case	↘ Annually
Cultural Heritage 	Number of places of cultural interest for which accessibility is improved (museums, monuments, archaeological sites)	number	↘ Based on the periodicity of recording by the competent authorities

<u>Appraisal of the Capacities to Adress Challenges:</u>

The current draft NISWMS, written in line with Article 10 of Law No. 80/2018, has undergone a compatibility analysis with all the national and local plans, programs, policies, and strategies that could have implications on it or vice versa. The NISWMS is compatible with all relevant plans, programs, policies, and strategies. The NISWMS is also compatible with regulations related to waste management and environmental and social impact and risk management, relevant social regulations, national and international environmental standards, and relevant international conventions listed above, and should ensure compliance with them.

It was apparent that the Lebanese SWM framework requires legislative reforms supporting the NISWMS implementation and upgrading the current WM system. The adoption of the ISWM Law (Law No.80/2018) is of

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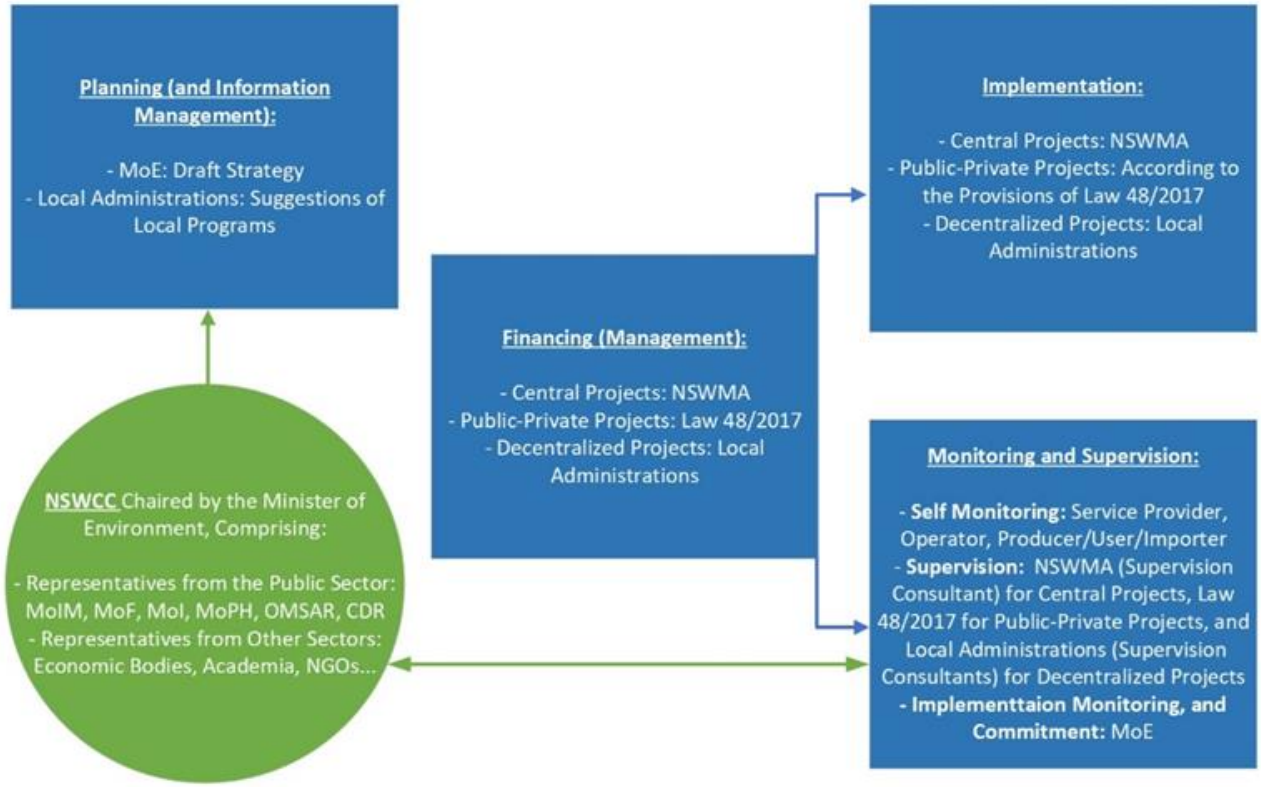
major value for the set-up of the appropriate general framework for ruling the SWM sector and significant steps have been taken recently by the GoL to address important gaps. However, remaining legal measures are still needed to implement the NISWMS, mainly related to the establishment and operationalization of the National Solid Waste Management Authority (NSWMA), the establishment and implementation of a cost recovery system and Extended Producer Responsibility, and establishment of the Management Information System (MIS) for waste management and self-monitoring reports.

The institutional framework for waste management in line with Law 80/2018 is illustrated below.



Regarding financing, funds from donors should ensure part of the infrastructure financing; public-private partnerships should also be promoted and encouraged for investment in solid waste infrastructure to ensure coverage of all SZs. As for operation and maintenance, sources of financing should be SWM fees collected from households, institutions, and establishments once the cost recovery law (amendment of Law 80/2018) is enacted, Sustained awareness and communication campaigns and activities need to be part of the system and must be accounted for in O&M costs.

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To enable successful implementation of the strategy, the needed qualified staff (MoE, local authorities, NSWMA…) are the first requirement, in terms of number and qualifications. Thus, central, and local authorities that have lost their staff as a result of the financial crisis since 2019 must be re-staffed to be able to assume their role. Capacity building for stakeholders involved in SWM is required where needed to ensure the staff can carry out the roles they are assigned. Capacities of supervisory entities in managing environmental and social risks and monitoring implementation of the SESA are also required. Finally, inclusion of Informal waste management operators in the formal waste management sector is recommended to solve the waste picking issue while avoiding negative implications on these players.

Conclusions and Recommendations

The SESA has provided valuable insights into the potential environmental and social implications associated with implementing Lebanon's National Integrated Solid Waste Management Strategy (NISWMS). By examining key environmental and social parameters relevant to the Strategic Objectives (SOs) and their specified Strategic Sub-Objectives (SSOs), some areas of concern and potential challenges have been identified that require attention.
The SESA underscores the need for integrating environmental and social considerations during the implementation of the NISWMS, emphasizing critical aspects like biodiversity, air quality, and cultural heritage. The SESA recommends mitigation measures, stakeholder engagement, and monitoring frameworks for sustainable waste management. Implementation of NISWMS, guided by Law 80/2018 principles, is vital for safeguarding Lebanon's environmental and social integrity. The SESA highlights the pivotal role of NISWMS in fostering sustainable waste management practices and underscores the importance of diligent enforcement and monitoring for Lebanon's well-being.

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