

MoE/UNDP PARTNERSHIP:

KEY

ACHIEVEMENTS

FROM 2010 TO 2015



REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT



*Empowered lives.
Resilient nations.*

FORWARD BY MINISTER OF ENVIRONMENT

In the current, challenging situation that Lebanon is facing within the national and regional context, the political scene is governed by many pressing priorities related to security and stability, leaving environmental aspects marginal on the list of priorities of the decision-making process in the country. This is reflected by the fact that budget is not sufficient, nor are there enough human resources needed to make the Ministry of Environment (MoE) a strong institution that can embrace the role of safeguarding the natural heritage of the country in the interest of the current and future generations.

The environmental situation continues to be alarming due to many structural and emerging factors. Such factors include, but are not limited to, our weak enforcement of environmental regulations; the decline in the quality and quantity of water resources exacerbated by the impacts of climate change; the deterioration of our air quality due to emissions from the transport, industry and energy sectors; and, last but not least, the increasing pressure on Lebanon's biodiversity and natural heritage, both from anthropogenic sources and climate change, whereby the country is witnessing extinction of some of its species and loss of its forest coverage. Lebanon's urban sprawl and haphazard urbanization is further aggravated by a dramatic increase of its population due to the influx of an overwhelming number of displaced Syrians; making Lebanon the country that hosts the highest number of displaced people as a proportion of its population (nearly 30%). In turn, this leads to further pressure on the country's natural resources.

However, within these challenging circumstances is a window of hope and a strong signal that the MoE presents in this publication, exhibiting some of its achievements in partnership with the United Nations Development Programme (UNDP) that have been built upon an institutional and strategic basis to deliver a long-lasting impact for the improvement of environmental management and sustainability in Lebanon.

This report delivers a strong message that there are robust and tangible results despite the difficulties we face at the Ministry, and that we can deliver optimal results with the trust and support of our partners in development, who, in this case, is the UNDP. This report also serves to communicate Lebanon's position to obtain support from other international agencies in prioritizing Lebanon's environment, as the country strives to achieve this at a national level.

I invite you to read this report with the perspective of building upon this foundation that we are establishing at the MoE to move us towards a brighter future.

Mohamad Al Mashnouk
July 2016

FORWARD BY UNDP RESIDENT REPRESENTATIVE

During the last decade, Lebanon faced several crises and has been overwhelmed by local and regional instability. During this time and as a result, the country's environmental sector has not been a priority on the political agenda and has been considerably neglected. The latest refugee crisis only added to the already fragile and poor state of the country's environment by increasing pressure on natural resources such as water and land. Internal disaccord has also led to the emergence of serious environmental issues like that of solid waste which raised public concern and protest. The years of negligence have also resulted in severe pollution in certain natural ecosystems such as the Litani River and the Qaraoun Lake.

The Ministry of Environment, with its limited personnel and resources, has continuously worked hard in promoting environmental management measures across economic sectors and advocated for legislation to protect natural sources. Various donors and institutions have been providing support to the Ministry throughout the years. UNDP has been a long-standing partner of the Ministry of Environment since its creation in the early 1990s. This report presents the collaboration between these two institutions over the past six years.

At the international level, all Member States of the United Nations adopted The 2030 Agenda for Sustainable Development which officially came into effect on 1 January 2016, and will run through to 2030. These goals come after the Millennium Development Goals which Lebanon had succeeded in meeting some of the targets for, specifically those on education and health. However, it remains far from achieving those under the Sustainable Environment Goal.

In December of 2015, Lebanon also renewed its commitments on combating climate change and increasing the resilience by submitting its Intended Nationally Determined Contributions to the UN Framework Convention on Climate Change.

As such, these international commitments provide unique opportunities to push forward the crucial need for sustainable, environmentally-friendly development in Lebanon and to prioritize the protection and clean-up of natural resources as a prerequisite to stability and resilience at the national level.

UNDP strongly believes that Environmental Sustainability can be a key entry point for meeting The 2030 Agenda for Sustainable Development, which strives for a world that is just, rights-based, equitable and inclusive. This report is proof that significant achievements can be reached with limited resources but strategic efforts.

Philippe Lazzarini
July 2016

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LIST OF ACRONYMS

BUR	Biennial Update Report	MoF	Ministry of Finance (of Lebanon)
CBD	Convention on Biological Diversity	Mol	Ministry of Industry (of Lebanon)
CC	Climate change	MP	Montreal Protocol
CCCU	Climate Change Coordination Unit Project	MSB	Migratory Soaring Birds
CDR	Council for Development and Reconstruction (of Lebanon)	NAP	National Action Plan
CEDRO	Country Energy Efficiency & Renewable Energy Demonstration Project	NCE	National Council for the Environment
COP	Conference of Parties	NEEREA	National Energy Efficiency & Renewable Energy Action Plan
EE	Energy Efficiency	NGO	Non-Governmental Organization
EIA	Environmental Impact Assessment	NOU	National Ozone Unit Project
ERML	Environmental Resources Monitoring in Lebanon Project	NWSS	National Water Sector Strategy
EU	European Union	ODS	Ozone-Depleting Substances
GDP	Gross Domestic Product	PCBs	Poly-Chlorinated Biphenyls
GEF	Global Environment Facility	POPs	Persistent Organic Pollutants
GHG	Greenhouse Gas	PV	Photovoltaic
GoL	Government of Lebanon	RE	Renewable Energy
HCFC	Hydrochlorofluorocarbons	SRLWR	Safeguarding & Restoring Lebanon's Woodland Resources Project
HHC	Higher Hunting Council (of Lebanon)	SEA	Strategic Environmental Assessment
HPMP	HCFC Phase-out Management Plan	SME	Small and Medium Enterprises
IEE	Initial Environmental Examination	SWH	Solar Water Heaters
LARI	Lebanese Agricultural Research Institute	SWM	Solid Waste Management
LCWCM	Lebanese Centre for Water Conservation and Management Project	TA	Technical Assistance
LCEC	Lebanese Centre for Energy Conservation	TNA	Technology Needs Assessment for Climate Change
LECB	Low Emission Capacity Building Programme	TNC	Third National Communication to the UNFCCC
LEPAP	Lebanon Environmental Pollution Abatement Project	TOR	Terms of Reference
M&E	Monitoring and Evaluation	UN	United Nations
MDG	Millennium Development Goals	UNCCD	United Nations Convention to Combat Desertification
MLF	Multi-Lateral Fund (of the Montreal Protocol)	UNDAF	United Nations Development Assistance Framework
MoA	Ministry of Agriculture (of Lebanon)	UNDP	United Nations Development Programme
MoE	Ministry of Environment (of Lebanon)	UNFCCC	United Nations Framework Convention on Climate Change
MoEW	Ministry of Energy and Water (of Lebanon)	WB	World Bank

1. INTRODUCTION

This publication captures the cooperation between the Ministry of Environment (MoE) and the United Nations Development Programme (UNDP) over the past six years, which serves as the result of a long-standing cooperation since 1993. Its objective is to present the key achievements of the MoE/UNDP's cooperation in view of providing a platform for policy dialogue and lessons learned, as well as for future planning of environmental interventions, specifically, and sustainable development, generally.

MoE was established in 1993 in response to strong political will to address environmental priorities in Lebanon, in the wake of the Sustainable Development Summit of 1992. Since 1993, a total of 14 different Ministers of Environment have been in place, playing an important role in setting the MoE's agenda to address environmental challenges that Lebanon faces. Each Minister proposed a Programme of Work in line with the Government's declaration and in line with the country's environmental priorities. The latest MoE Work Programme was established in 2014, and continues the policies and plans set forth by previous Governments.

Work Programme of the MoE under the Government of "National Interest" Proposed by H.E. Mr. Mohamad Al Mashnouk, Minister of Environment under the Decree No. 11217 Dated 15/02/2014

Under the slogan of "My Environment is My Country," and in partnership with the public and private sectors, as well as the civil society and international organizations, the MoE of the Government of "National Interest" will seek to complete the initiatives of the previous Governments, specifically in the following areas:

- Ratifying environmental conventions and protocols
 - Adopting key environmental laws
 - Issuing key environmental decrees and decisions
- Adopting key strategies for the well-being of the citizens
 - Supporting environmental governance
 - Protecting the natural resources of Lebanon
- Reinforcing the management of environmental risks



Mohammad Naji Rahal
(Nov 2009 – June 2011)



Nazem El Houry
(June 2011 – Feb 2014)



Mohamad Al Mashnouk
(Feb 2014 – to date)



Martha Ruedas
(Nov 2007 – Dec 2010)



Robert Watkins
(Feb 2011 – Jan 2014)



Ross Mountain
(Feb 2014 – July 2015)



Philippe Lazarini
(Aug 2015 – to date)

The MoE/UNDP cooperation is based on the national environmental priorities set forth by MoE, and is framed within the joint strategic planning of the UN system in Lebanon and the Lebanese Government, referred to as the United Nations Development Assistance Framework (UNDAF).

As such, the MoE/UNDP cooperation aims to achieve the UNDAF's Outcomes, and, more specifically, the following outcome: "By 2014, improved accessibility to management of natural resources and enhanced response to national and global environmental challenges." By achieving this outcome, the MoE/UNDP cooperation, jointly with the other concerned UN agencies in Lebanon, supports the UNDAF's contribution to the Millennium Development Goal (MDG) number 7: "Ensuring environmental sustainability."

From 2010 to 2015, the MoE/UNDP programme was structured around three main areas of intervention, allowing MoE to respond to national priorities while constituting an integral part of the UNDAF. These areas included the following:

1. Mainstreaming environmental considerations at the policy, strategic and planning levels
2. Improving government capacity to meet obligations related to international environmental conventions and protocols
3. Mainstreaming climate change considerations into national priorities



Key pillars of the MoE/UNDP Programme in 2010–2015

Under these three areas of intervention, the MoE/UNDP programme included approximately 20 projects between 2010 and 2015; some of which have been completed during this period, while others were developed during this period, and are expected to be implemented after 2015. Through these projects, MoE has been able to better respond to the growing challenges in Lebanon in the field of environmental management and sustainable development.

MoE/UNDP projects between 2010 and 2015

No	Project	Duration	Budget (mil \$)	Main Donors
Mainstreaming environmental considerations at the policy, strategic, and planning levels				
1	Institutional Support to MoE	Jan 2010 - Dec 2016	~7	Government of Lebanon, UNDP
2	Environmental Resources Monitoring in Lebanon (ERML)	Jan 2011 - June 2014	1.6	Government of Greece
3	Integrated Management of Municipal Solid Waste for the cazas of Baalbek and Hermel	Jan 2011 - June 2016	2.8	Government of Italy
4	Rehabilitating the Saida Dumpsite	Oct 2012 - Dec 2016	25	Government of Lebanon
5	Lebanon Environmental Pollution Abatement Project (LEPAP)	Jan 2014 - Dec 2018	18	Government of Italy, WB
Improving government capacity to meet obligations related to international environmental conventions and protocols				
6	Institutional Support for the Montreal Protocol (Phase VI–VIII)	Apr 2009 - Aug 2015	0.5	Multi-Lateral Fund of the Montreal Protocol (MLF)
7	HCFC Phase-out Management Plan (HPMP) – Stage I preparation	Jan 2010 - Apr 2012	0.2	MLF
8	HCFC Phase-out Management Plan (HPMP) – Stage I	Mar 2012 - Dec 2017	2.5	MLF
9	HCFC Phase-out Management Plan (HPMP) – Stage II preparation	Sept 2014 - Dec 2016	0.2	MLF
10	HCFC Phase-out Management Plan (HPMP) – Stage II	Nov 2015 - Dec 2025	4.5	MLF
11	Reducing Healthcare Waste to Avoid Environmental Releases of Dioxins and Mercury	June 2009 - Dec 2012	0.6	Global Environmental Facility (GEF)
12	Mainstreaming Conservation of Migratory Soaring Birds (MSB)	June 2008 - May 2015	1.3	GEF
13	Safeguarding and Restoring Lebanon's Woodland Resources	Jan 2009 - Dec 2014	1.0	GEF
14	Sustainable Land Management in the Qaraoun Catchment	Expected to start July 2016	3.0	GEF
Mainstreaming of climate change considerations into national priorities				
15	Second National Communication to the UNFCCC	July 2007 - Feb 2011	0.4	GEF
16	Third National Communication to the UNFCCC	Apr 2011- Dec 2016	0.5	GEF
17	Technology Needs Assessment for Climate Change	June 2011 - Sept 2012	0.1	GEF
18	First Biennial Update Report (BUR)	Dec 2013 - Apr 2015	0.3	GEF
19	Low Emission Capacity Building Programme (LCBP)	Jan 2013 - Dec 2017	1.0	Government of Australia & Germany, EU
20	Mainstreaming Climate Change into Lebanon's Development Agenda	Mar 2013 - Apr 2015	0.5	Lebanon Recovery Fund

2. ENVIRONMENTAL POLICY AND MAINSTREAMING

Environmental governance in Lebanon constitutes one of the main challenges facing MoE when it comes to responding to environmental priorities. According to the World Bank *Country Environmental Analysis 2011*, the environmental sector in Lebanon is “characterized by an uncompleted legal and institutional framework as well as by ineffective policies to address the challenges and political constraints to deliver reforms”.

Despite major breakthroughs in the adoption of the Environmental Protection Law in 2002, planning and implementation of environmental policies has remained very weak prior to the issuance of related legal procedures in 2012.

In 2002, 9 years after its establishment, the MoE succeeded to pass the Environmental Law (Law number 444/2002), which framed Lebanon’s Environmental Principles covering the following overarching principles:

1. Precaution (cleaner production techniques)
2. Prevention (best available technologies)
3. Polluter-Pays-Principle (polluters pay for pollution prevention and control)
4. Biodiversity conservation (in all economic activities)
5. Prevention of natural resources degradation
6. Public participation (free access to information and disclosure)
7. Cooperation between central government, local authorities, and citizens
8. Recognition of local norms and customs in rural areas
9. Environmental monitoring (pollution sources and pollution abatement systems)
10. Economic incentives to encourage compliance and pollution control
11. EIA process to control and mitigate environmental degradation

Although the mandate of MoE was restructured in 2009—providing a better definition of the function and responsibilities of each unit, including staff size and qualifications, which is critical to the ministry’s ability to respond to its mandate in a timely and cost-effective manner—, MoE’s staffing status remains a major hurdle in doing so. According to the MoE organizational decree, there are 118 staff of 1, 2 and 3 categories, and 182 staff of 1, 2, 3, 4 and 5 categories. If all staffing allocations are considered (technical and administrative), in december 2015 MoE was functioning on a basis of approximately 39% of its organizational decree.

Since its inception, MoE has not received the budget necessary for it to be effective. Although MoE’s annual budget increased from approximately \$1 million in 1993 to approximately \$8 million in 2015, this budget is not sufficient to meet the MoE’s needs to achieve its Programme of Work. As such, MoE’s capacity to strengthen the environmental legal framework and ensure its enforcement remains weak and does not allow a strong foundation for environmental governance. MoE also has key gaps for assessing and implementing modalities to strengthen environmental policy and mainstream this policy at the sectoral level.

For these reasons, environmental policy and mainstreaming constitutes the most important long-term and strategic priority for strengthening environmental management in Lebanon, and has been a priority focus of previous and current support under the MoE/UNDP cooperation programme through the following key projects:

1. Institutional Support to MoE Project
2. Environmental Resources Monitoring in Lebanon Project
3. Integrated Management of Municipal Solid Waste for the cazas of Baalbek and Hermel Project and the Rehabilitation of the Saida Dumpsite Project
4. Lebanon Environmental Pollution Abatement Project

2.1. Institutional Support to MoE Project

In 2010, the MoE/UNDP cooperation established an Institutional Support mechanism that allows MoE to identify and assess technical needs at the national level, as well as plan and program appropriate response measures. Such a mechanism would ultimately lead to increased sustainable, environmental development at the national policy level. Since 2010, the Institutional Support project allowed MoE to respond to several environmental priorities and initiate a long-term process for managing the country's environment.

Development of priority environmental strategies and action plans

Beginning in 2010, the Institutional Support Project initiated the preparation, publication, and dissemination of key plans and strategies to respond to national priorities in environment and sustainable development. At a national level, two main reports were prepared to provide a clear and long-term basis for planning environmental management and sustainable development in Lebanon. These reports are as follows:

- The State and Trends of the Lebanese Environment (SOER) published in 2011, providing an extensive and comprehensive baseline on Lebanon's sustainable development trends in Lebanon
- The National Report to the UN Conference on Sustainable Development (Rio+20) published in 2012, constituting Lebanon's first unified multi-stakeholder stocktaking for sustainable development

Since March 2015, and in cooperation with the MoE/European Union Programme for "Support to Reforms-Environmental Governance (StREG)", the Institutional Support project has supported MoE to embark on the development of Lebanon's National Sustainable Development Strategy, providing a long-term vision for Lebanon by 2030 as a joint initiative with the Presidency of the Council of Ministers.

Development of in-depth technical assessments

The Institutional Support Project also conducted in-depth assessments and plans for key sectors closely affected by environmental priorities. It was structural in providing an understanding of the threats facing these important sectors, and provided policy-making, action-oriented and budgeted solutions for addressing these threats. These assessments included the following:

- Business plan for combating pollution of the Qaraoun Lake in 2011;
- Master plan for the closure and rehabilitation of uncontrolled dumps in 2011;
- Assessment and implementation of the first artificial reef in the Abdeh shores (North Lebanon) in cooperation with the Lebanese Army, Ministry of Public Works and Transport, University of Balamand, Lions Club and Rotary Club in 2012;
- Preliminary roadmap for quarries rehabilitation and initiation of preparatory studies for 15 pilot quarrying sites of various types across all Lebanon in 2014 based on 150 pre- and post-inspection visits and recommendations for reforming the quarrying sector undertaken in 2010/2011;
- In cooperation with the MoE/European Union Programme for "Support to Reforms-Environmental Governance (StREG)", preparation of the Environmental Assessment of the Syrian Conflict in 2014 and identifying priority interventions for addressing these impacts;
- Provision of continuous technical support towards Integrated Solid Waste Management in Lebanon, leading to the issuance of several Council of Ministers decisions related to this sector in 2014 and 2015;
- Provision of continuous support for holding the meetings of the National Council for the Environment and deploying a mission to support its mandate through the European Union in 2015;
- Assessment of the efficiency of the EIA system in Lebanon 2 years following its implementation in 2012-2014, leading to the issuance of the new EIA/IEE decisions published in June 2015; and
- Supporting the preparation of the UN Secretary General yearly reports on the implementation of the UN General Assembly resolutions for the Lebanon oil spill since 2006, and conducting the studies requested by the General Assembly.

Overall support to MoE's program of work

The Institutional Support Project also supports the MoE in planning and delivering its functions through the following:

- Assisting in preparing MoE work programmes based on the Government Policy Statements (2009, 2011 and 2014), reporting on work progress and publication of end of term booklets covering the major achievements;
- Strengthening MoE's institutional structures through: (1) preparation, adoption, and implementation of an in-house recruitment law; (2) appointment of most high level positions (heads of services, departments, and divisions); (3) recruitment of about 20 technical and administrative staff in 2011 (15% of planned workforce) and approval of the Council of Ministers in October 2014 to recruit 27 additional technical staffing (32% of planned for the same category); and (4) preparation and issuance of other ministerial decisions and circulars related to human resources management, and national coordination of bi-lateral projects;

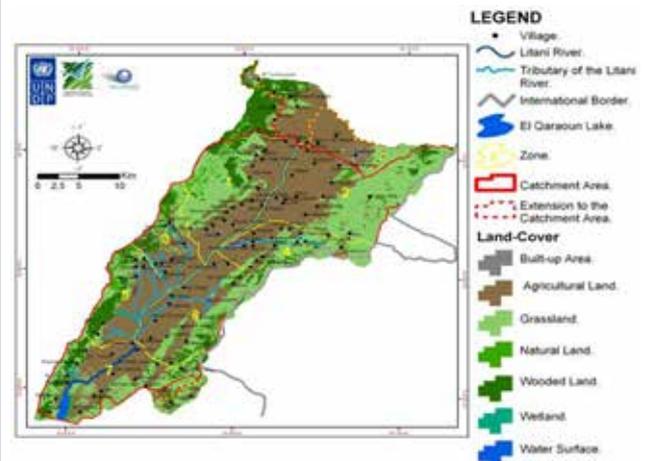
- Providing various technical, legal, and administrative support to the Minister's office and to the various MoE departments for the preparation for key international and regional environmental meetings (e.g., UN, EU, Council of the League of Arab States), as well as MoE's international partners periodic meetings, signature of memorandums of cooperation with 12 ministries, re-furbishing works at the MoE to facilitate access and other daily follow up;
- Developing and implementing an extensive Environmental Awareness Raising Programme in 2012/2013;
- Supporting resource mobilization efforts of MoE (refer to Section 5.3); and providing continuous technical and coordination support for the implementation of the various donor-funded projects.

Support the development and implementation of the legal framework

The Institutional Support Project has been fundamental in developing and implementing a priority regulatory framework for environmental management in Lebanon, as presented in Section 5.2. It also paved the way for major legal developments that strengthened environmental governance in Lebanon, covering the following:

- Ratification of priority conventions and protocols related to international environmental issues;
- Follow up on the adoption of key environmental laws and application decrees, as well as relevant Council of Ministers' and Ministerial decisions; and
- Setting an initial basis for a system for inspection and enforcement through an agreement with an international NGO based in Lebanon as "Environmental Watchdogs for Environmental Protection" (e.g., periodic, proactive and reactive inspection of nature reserves and sites; quarries, hospitals and healthcare waste treatment facilities; solid waste treatment facilities; etc.)

The Business Plan for Combating Pollution of the Qaraoun Lake (2011) followed the Environmental Parliamentary Commission's recommendation in 2004 to address environmental threats on the Litani River, the largest river in Lebanon. The Business Plan identified the pollution sources of the Upper Litani River catchment area and Qaraoun Lake, and constitutes an important baseline and roadmap for addressing sources of pressure affecting Qaraoun Lake. The Business Plan estimated that approximately \$140 Million is needed to alleviate the pressures from solid waste, municipal, and industrial wastewater and agriculture.v



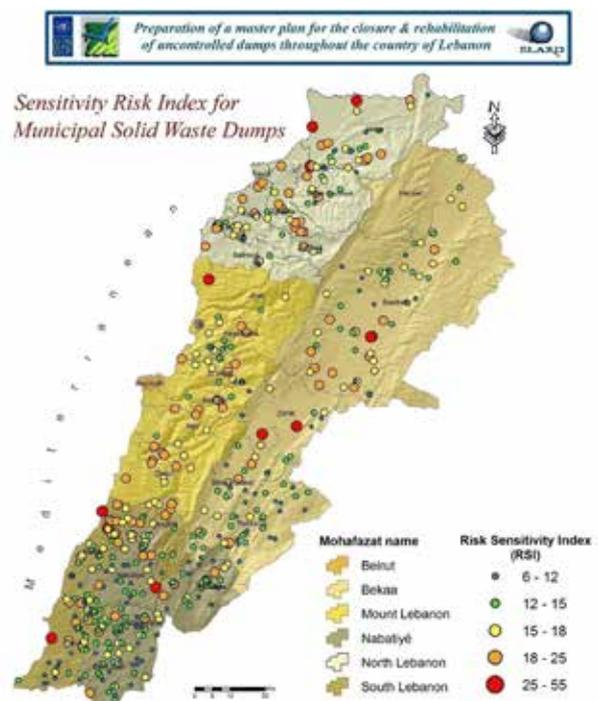
Area of Study of the Business Plan for Combating Pollution of the Qaraoun Lake

The Master Plan for the Closure and Rehabilitation of Open and Uncontrolled Dumps in Lebanon (2011) was initiated given that the solid waste management situation in Lebanon has been considered a top priority for MoE in past years, particularly due to the high rate of open dumping (estimated to be equivalent to 31% of the total waste quantity in Lebanon according to the SoER in 2010).

The Master Plan had the following goals:

- Establishing a comprehensive database of all Municipal Solid Waste (MSW) and Construction and Demolition Waste (CDW) dumps over the Lebanese territory;
- Prioritizing identified dumps in terms of necessity for rehabilitation; and
- Identifying the most suitable rehabilitation methods for each dump, along with an action plan for its rehabilitation and/or closure

The Master Plan surveyed a total of 670 dumps over the Lebanese territory; full characterization of the dumps was completed and transferred into a Prioritization Decision Tool based on a Geographical Information System (GIS) format. It also provided cost estimates for the rehabilitation of all dumps, which was approximately US\$ 50 million.



Risk Sensitivity Index Map of MSW Dumps

2.2. Environmental Resources Monitoring in Lebanon Project

The Environmental Resources Monitoring in Lebanon (ERML) Project (erml.moe.gov.lb) was implemented between 2011 and 2014 in response to the oil slick on Lebanese shores that occurred in the summer of 2006. It was also based on the MoE's priorities, with funding from the Government of Greece and support from UNDP and UNEP.

Given the importance of the coastal area in the socio-economic fabric of the country, and considering the growing concerns on health and environmental conditions, the project addressed two areas of focus: coastal and marine environments and air quality.



*Installation of an Air Quality Monitoring device at a pine forest
(Photo from N. Masri)*



*Air Quality Monitoring device at the Lebanese University
(Photo from N. Masri)*

Coastal and marine environments

The ERML project supported the identification of vulnerable coastal and marine environments based on approved scientific methodologies, upon which a monitoring programme was proposed for implementation by appropriate national authorities. Furthermore, and taking socio-economic and environmental stresses into account, opportunities for socio-economic development based on the green economy concept were proposed to improve management of the coastal zone. To this day, the project continues to support the implementation of projects at MoE, revolving around the thematic areas of Integrated Coastal Zone Management/Integrated Water Resources Management (ICZM/IWRM) in line with commitments of Lebanon to international commitments, namely to the Barcelona Convention.

Air quality in urban centres

The ERML Project also holistically addressed the management of air quality in Lebanon, including monitoring, assessment, and management activities. The project built on existing legal texts to develop adequate policy, applicable legislative and regulatory tools to improve air quality management both at the central and source levels.

Monitoring

By 2013, the ERML Project successfully established a national air quality monitoring programme around hotspot areas, and implemented the first phase of a national air quality monitoring network in line with the proposed Draft Law for the Protection of Air Quality: five (5) air quality monitoring stations were hosted by academic institutions (public and private) and municipalities, thus supporting the MoE in sustaining the network and ensuring that line ministries are also engaged in the process. The MoE's monitoring capabilities were furthermore improved with the support of the EU-funded StREG programme that financed the procurement of the second and final phase of the network. This provided a better understanding of air quality at the national level based on ERML's monitoring programme. The project also developed an Air Quality Index (AQI) to help the Lebanese citizens understand what local air quality means to their health. Each category of the AQI corresponds to a different level of health concern. A specific colour is assigned to each AQI category to make it easier to indicate whether air pollution is reaching unhealthy levels in the different areas. Under the message "Help Camil the Chameleon stay Green," Camil, the AQI mascot, is regularly updated and posted on the ERML project and MoE websites for the public.

Assessment

Furthermore, and in line with the Draft Law for the Protection of Air Quality, the project set the basis for collaborating with research and academic bodies to support knowledge building and data management. Data validation and analysis is being conducted to this day through a collaboration with the Faculty of Sciences at the Saint Joseph University (FS-USJ), a local university that supports the MoE to synthesize the collected information

for use in policy-making, as well as for raising awareness at the public level. Additionally, with the support of the FS-USJ and with technical assistance by the Italian national agency for new technologies, energy and sustainable economic development, this collaboration also led to the production of a number of guidance documents on air dispersion modeling.

Management

Additionally, the project identified gaps and priorities for action using a holistic approach to air quality management in Lebanon. As reflected above, it engaged the MoE in sustaining monitoring activities by expanding the existing network by 13 air quality monitoring stations and a total of 18 weather stations, as well as by securing Operation and Maintenance activities through public funds. The project also initiated the update of existing regulatory and legislative texts for improved management of air quality from stationary sources. This includes the update of Environmental Limit Values for Stack Emission (MoE decision 8/1 January, 2001) to be issued in 2016, and the development of monitoring and reporting guidelines for stationary sources, including large emitters in cooperation with the MoE/EU StREG programme under the industrial compliance objectives of the MoE. Furthermore, and in cooperation with the MoE/EU StREG programme, the project supports the development of a National Strategy for Air Quality Management, including strategic and locally generated priority actions to improve air quality. Among the objectives that are set is the goal to mainstream air quality management in priority sectors, as well as mainstream the communication and outreach with the public and with policy makers for decision-making purposes. The strategy will also be guided by the need to develop partnership mechanisms and research and development modalities that build on ties pre-established through the ERML project, considering the dynamic nature of the topic and the need for specialized expertise.

Support to the Second Phase of the National Air Quality Monitoring Network

Since 2014, the Environmental Resources Monitoring in Lebanon Project has been supporting the MoE/European Union Programme for “Support to Reforms-Environmental Governance (StREG)” to implement the second phase of the national air quality monitoring network in line with the proposed Draft Law for the Protection of Air Quality.

By 2016, the StREG Programme is expected to have established 13 additional national air quality monitoring stations around hotspots, integrated the existing network, and strengthened the management of air quality data currently captured by the existing five stations in hotspot areas. The ERML project ensures that the data from both phases is validated and put at the disposal of the MoE, which will reinforce air quality analysis, planning, and communication.



The ERML project established five operational air quality monitoring stations in hotspot areas.

2.3. Municipal Solid Waste Management Projects

Based on the **Master Plan for the Closure and Rehabilitation of Open and Uncontrolled Dumps in Lebanon of 2011**, and in line with the **Roadmap for Integrated Solid Waste Management**, UNDP has supported the MoE in the implementation of two major initiatives addressing the solid waste management challenge in Lebanon.

In 2013, in cooperation with the Saida municipality and with MoE funding, UNDP initiated the **Rehabilitating the Saida Dumpsite**, known locally as the “trash mountain,” to solve an environmentally unacceptable situation and to rehabilitate the land in the vicinity of the dump. The Saida dumpsite had been in use since 1982 and contained approximately 1.5 million m³ of waste, covering a surface area of approximately 6.5 hectares. Its maximum height reached 58 m. The dumpsite received approximately 300 tons of fresh waste per day, and was a major source of environmental pollution and a public health disaster.

The project aims at the following:

- Remove the “trash mountain” and replace it with a green park: this was achieved by recovering around 600,000 m³ of construction/demolition waste and removing approximately 900,000 m³ of organic wastes into a sanitary landfill;
- Construct an engineered sanitary landfill (around 65,000 m²) according to EU environmental standards, with gas and leachate monitoring; and
- Construct a public park (around 35,000 m²) south to the sanitary landfill, with over 10,000 trees and shrubs, recreational areas, an outdoor theatre and sea view hills

In addition to the project in Saida, the MoE called upon UNDP to implement an **Integrated Management of Municipal Solid Waste for the Cazas of Baalbek and Hermel**.

In collaboration with the union of municipalities of Baalbek, and with the support of the Italian Government, a Master Plan for the “Integrated Management of Municipal Solid Waste for the cazas of Baalbek and Hermel” was prepared. It identified the various stakeholder responsibilities towards the project, set priorities and budget needs that would ensure the sound management of solid waste in the region.

Based on this planning process, the project implemented the secondary collection system, in addition to setting up the needed infrastructure and provision of capacity building for the municipality. This was complemented by various interventions, funded by the European Union: the construction of the sorting/composting facilities by OMSAR, the implementation of the sanitary landfill, and the construction of a biogas and electricity generation plant by COSV (an Italian NGO).



*Construction of the sanitary landfill replacing the Saida dumpsite
(Photo from N. Gharib)*



*The public park replacing the Saida dumpsite in its final phase
(Photo from N. Gharib)*

2.4. Lebanon Environmental Pollution Abatement Project

Although the industrial sector’s share in the national economy is still small—with less than 10% of Lebanon’s Gross Domestic Product (GDP) over the past 10 years (CAS, 2014)—Lebanon’s industrial sector is considered a real booster for the financial system, as well as for employment.

Given the importance of addressing the consequences of industrial pollution, the Government of Lebanon (GOL), represented by the MoE, has demonstrated a strong commitment to addressing industrial pollution and encouraging “green” investments through incentives that were recently introduced with the support of the Central Bank (Banque du Liban –BDL). Not only will this lead to environmental benefits, but it can also optimize industrial production costs by adopting the “Sustainable Consumption and Production” principles.

Why Is Industrial Pollution a Priority?

According to the Industrial Census of 2010 conducted by the Ministry of Industry (MoI), 50% of the industries are based in the Mohafazat of Mount Lebanon. Industrial pollution results in an important pressure on the natural ecosystem and the health of the population in the Mohafazat of Mount Lebanon, especially given that it is the most populated part of the country, accounting for 40% of total Lebanese population.



In 2014, the MoE launched the **Lebanon Environmental Pollution Abatement Project (LEPAP)** (www.moe.gov.lb/lepap) with funding from the Italian Government through the Italian Cooperation and UNDP, the World Bank through the Ministry of Finance (MoF) and the Central Bank, and in coordination with the MoI, the Council for Development and Reconstruction (CDR), the Association of Banks in Lebanon, the Association of Lebanese Industrialists and the Federation of Chambers of Commerce, Industry and Agriculture. The project plays a significant role in promoting an innovative and replicable process to address industrial pollution, and mobilizing financial resources for implementation of pollution reduction solutions. LEPAP seeks to pursue a sequenced approach by targeting priority areas and helping individual industries achieve environmental compliance.

Since its induction, LEPAP has delivered extensive support to MoE for the development and implementation of needed legal, institutional, technical and capacity-building responsibilities related to environmental compliance of industries:

- On the legal front, LEPAP assisted in developing and adopting the application decisions to the Decree 8471/2012 and the MoE decision 202/1 of 2012 on environmental compliance, following a participatory approach. It also supported the EU funded StREG programme by preparing the draft decree pertaining to Article 20 of Law 444/2002 on tax incentives for environmental activities. The project prepared a ministerial decision on environmental audit review guidelines, and supported the MoE in enforcing related environmental legislation by developing site inspection checklists and conducting proactive and reactive inspections of selected industrial facilities.
- Institutionally, LEPAP supported the establishment of a joint MoE/Mol industrial database, including environmental information and Geographic Information System (GIS) mapping, as well as the improved administrative management of industrial related correspondence. It also helped the Ministry assess the needs of environmental laboratories for smoother implementation of the environmental compliance decree, and review the EIA and Environmental Audit studies for industrial establishments.
- On the technical level, LEPAP supported the preparation of the Sustainable Consumption and Production (SCP) Action Plan for the industrial sector in Lebanon, updated existing studies related to Hazardous Waste Management in the Industrial Sector and drafted environmental compliance guidelines for two sectors (Cement Mixing, Asphalt and Building Block; and Cattle Farms, Dairy, Slaughterhouse and Meat). The project also facilitated the preparation of Environmental Audits/Compliance Action Plans (CAPs) for 30 industrial enterprises and EIA studies for three industrial enterprises, as well as studied the recycling of organic waste generated by the wine sector (pilot study).
- In terms of capacity building and awareness, LEPAP conducted extensive communication and outreach activities for mobilizing the private sector as a whole, and the industries in specific, in the adoption of environmentally sound initiatives. This included the provision of continuous technical support, advice and training to industrial stakeholders for the development and implementation of environmental audits, which would define a comprehensive approach for addressing environmental measures that industries could adopt. LEPAP also supported MoE in nationally coordinating several initiatives funded by EU partners and others, such as organizing a workshop on the “Sustainable Management of Industrial Areas” and assisting in the coordination of seven trainings and workshops.
- Financially, LEPAP complemented the fore-mentioned technical assistance activities with the mobilization of the needed investments through concessional loans from the banking sector for the implementation of the compliance action plans by the industrial sector. The funded interventions would include pollution control measures to bring air emissions, effluent discharges and industrial waste generation into compliance with national environmental standards in a cost-effective manner through pollution prevention or remediation (e.g. resource recovery, adoption of clean technology, fuel substitution and waste minimization, in addition to end-of-pipe measures). To date, three industries have already obtained loans with LEPAP’s support; several other industries have also confirmed their interest and willingness to benefit from the LEPAP support to access concessional loans.

3. INTERNATIONAL CONVENTIONS

Lebanon ratified most Multilateral Environmental Agreements (MEAs) as early as 1966, and has accordingly benefited from international support and funding to address priority response to the national and international challenges facing Lebanon’s environment. UNDP has supported MoE in responding to Lebanon’s commitments under these agreements – refer to the table of the “Key Environmental Conventions Ratified by Lebanon” below.

This role was specifically activated since the Rio Conference on Sustainable Development in 1992 and the conventions that resulted from it, specifically the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change and the United Nations Convention to Combat Desertification. Other important conventions, including their protocols, were also ratified by Lebanon after the Rio Conference, and confirmed Lebanon’s involvement to join international efforts for environmental protection.

This section describes the cooperation between MoE and UNDP, which has specifically focused on the implementation of Lebanon’s obligations to the following environmental conventions and their related protocols:

- Vienna Convention for the Protection of the Ozone Layer
- Stockholm Convention on Persistent Organic Pollutants
- United Nations Convention on Biological Diversity
- United Nations Convention to Combat Desertification

Key environmental conventions ratified by Lebanon

Year of ratification	Key Environmental Conventions Ratified by Lebanon
1966	London Convention for the Prevention of Pollution of the Sea by Oil of 1954
1977	Barcelona Convention for the Protection of the Mediterranean Sea against Pollution of 1976
1983	London Convention for the Prevention of Pollution from Ships of 1973
1993	Vienna Convention for the Protection of the Ozone Layer of 1985
1994	Jamaica Convention of the Sea of 1982
1994	Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal of 1989
1994	United Nations Framework Convention on Climate Change of Rio de Janeiro of 1992
1994	Convention on Biological Diversity of Rio de Janeiro of 1992
1995	United Nations Convention to Combat Desertification of Paris of 1994
1999	Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat of 1999
2002	Stockholm Convention on Persistent Organic Pollutants of 2001
2006	Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade of 2004

3.1. Response to the Vienna Convention for the Protection of the Ozone Layer

The Vienna Convention and its Montreal Protocol for the Protection of the Ozone Layer are among the first global environmental conventions ratified by the Lebanese Government as early as 1993, which committed Lebanon to the complete phase-out of Ozone Depleting Substances (ODS). Lebanon also became eligible to receive assistance from the Multilateral Fund in order to meet its obligations under the Montreal Protocol, and developed its Country Programme and a National Strategy for the phase-out of ODS with the support of UNDP as early as 1994: both of which were approved by the Multilateral Fund in 1996.

Since 1998, UNDP was entrusted with the implementation of the Montreal Protocol in Lebanon and established the National Ozone Unit Project at MoE (www.facebook.com/nationalozoneunitlebanon) (NOU) to ensure the coordination, monitoring, and implementing of all Montreal Protocol's related activities. The NOU assisted the MoE in the effective and efficient phase-out of ODS, the adoption of policies and regulations, monitoring procedures and overseeing the programmes and projects specified in the Country Programme so the Government of Lebanon could meet its commitments under the Montreal Protocol.

Over the past six years, the NOU project sustained its efforts to help the MoE consistently comply with the Montreal Protocol obligations and control measures (ODS data reporting and reduction schedules and ratification of all Montreal Protocol amendments). In 2010, the NOU project achieved a complete phase-out of CFC consumption in the country, whereby it succeeded in eradicating all 923 Tonnes that were used in 1993 and initiated the required measures to respond to the Montreal Protocol's Decision XIX/6 of September 2007 for the adoption of an accelerated phase-out schedule for HCFCs. This had an ultimate target to reach a 35% reduction by the year 2020 (using the average of 2009 and 2010 consumption levels as the baseline levels).



*Reconversion of HCFC production in the refrigeration subsector
(Photo from M. Hussein)*



*Reconversion of HCFC production in the foam sub-sector
(Photo from M. Hussein)*

In order to achieve the 2013 and 2015 targets for HCFC phase-out, the Multilateral Fund Executive Committee approved the funding needed for the implementation of “Lebanon’s HCFC Phase-out Management Plan-Stage I” (HPMP Stage-I), which was made up of a combination of interventions, such as technology transfer investments, policies and regulations, technical assistance, training, awareness, communication and management, coordination, and monitoring in the foam, air conditioning and refrigeration sectors, to be implemented over six years from 2011 to 2017.

In 2015, the NOU project prepared the Strategy and Action Plan for Lebanon to comply with the post-2015 control targets for HCFC phase-out, including ways to achieve the 2020 control targets and, if necessary, post-2020 control targets. The comprehensive “Lebanon’s HCFC Phase-out Management Plan-Stage II” (HPMP Stage-II) includes Lebanon’s projections for HCFC reduction to 650 Tonnes by 2020 and complete phase-out of HCFC by 2027, and will be initiated in 2016.

Finally, the NOU project supports the MoE in developing and implementing needed institutional and capacity development activities, such as:

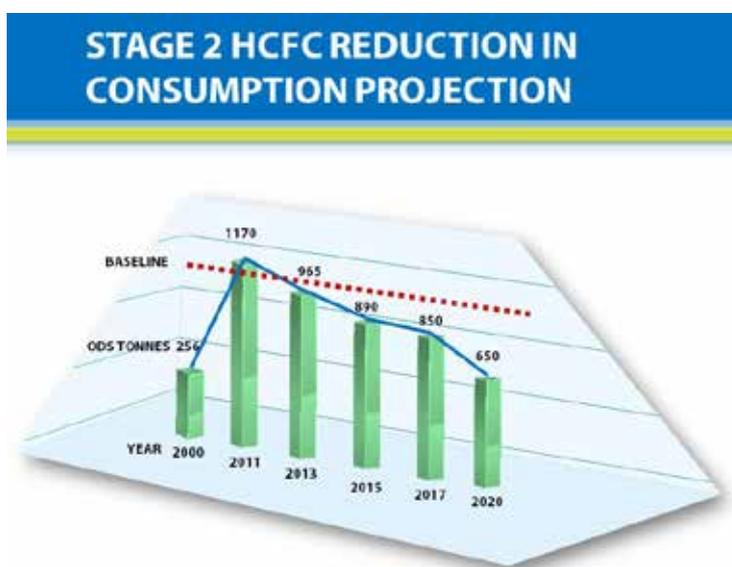
- Maintaining the enforcement of the ODS Licensing System Decree No. 2604 / 2009 and development of needed amendments and related Ministerial Decisions;
- Continuous provision of technical and policy advice to Governmental institutions to maintain the daily technical and logistical support to the Customs Authority for the enforcement and monitoring of ODS trade;
- Developing needed awareness and outreach programmes targeting all age groups and communities; and
- Participating in major international and regional meetings.

Why protect the ozone layer?

The ozone layer is a natural layer of gas in the upper atmosphere, which protects humans and other living things from the harmful ultraviolet (UV) rays of the sun.

Scientific evidence shows that certain man-made chemicals are responsible for the creation of the Antarctic ozone hole and the global ozone losses. These chemicals are industrial gases, which have been used for many years in a range of products and applications including aerosol sprays, refrigerators, air conditioners, fire extinguishers and crop fumigation. Increased UV levels at the Earth’s surface are damaging to human health. The negative effects include increases in the incidence of certain types of skin cancers, eye cataracts, and immune deficiency disorders. UV affects terrestrial and aquatic ecosystems, altering growth, food chains and biochemical cycles.

([//ec.europa.eu/clima/policies/ozone](http://ec.europa.eu/clima/policies/ozone))



HCFC Phase-Out Management Plan Projections

3.2. Response to the Stockholm Convention on Persistent Organic Pollutants (POPs)

Lebanon ratified the Stockholm Convention on Persistent Organic Pollutants (POPs) in 2002, and was concerned about the consequences of Persistent Organic Pollutants on the national and global environment, specifically in the health sector, such as the presence of dioxins and mercury, which are primarily a result of medical waste incineration and the breakage and improper disposal of mercury-containing devices, such as thermometers and sphygmomanometers.

Between 2009 and 2012, MoE benefited from funding from the Global Environment Facility (GEF) through UNDP, by joining a global programme that aimed at “**Demonstrating and Promoting Best Techniques and Practices for Reducing Health-Care Waste to Avoid Environmental Releases of Dioxins and Mercury.**” The project tried to demonstrate the effectiveness of non-burn, healthcare waste treatment technologies, waste management practices and other techniques to avoid environmental releases of dioxins and mercury.

The project established a pilot healthcare waste management plan in two model healthcare waste facilities in Lebanon. Moreover, several related procedures in the form of guidelines were updated and developed, including healthcare waste segregation, collection, internal transportation, storage, waste treatment and disposal, environmentally preferable purchasing, laboratory waste management, pathological waste management, safe handling of cytotoxic agents and related wastes, management of pharmaceutical wastes, management of chemical spills and management of blood and bodily fluids spills.

The project also conducted a review of infectious healthcare waste treatment centres in Lebanon, as well as a review of national policies and existing legal frameworks and developed priority legal texts. By the end of the project, there was a significant increase in the number of hospitals treating their infectious waste. The total quantity of treated infectious wastes across all healthcare facilities increased from 12% in 2009 to 65% in 2012.

Moreover, an extensive national programme of train-the-trainers was organized on various related topics, including waste reduction, safe handling, cleaning up and disposing of mercury waste and replacing equipment with non-mercury alternatives. Interactive awareness tools were also developed and used during the training workshops, including a video on healthcare waste management in hospitals and an interactive segregation game, aimed at improving personnel's skills in waste segregation.

What are the health effects of POPs?

Persistent organic pollutants (POPs) are organic compounds that, to a varying degree, resist photolytic, biological, and chemical degradation. Humans can be exposed to POPs through diet, occupation, accidents and the environment, including the indoor environment. Exposure to POPs, either acute or chronic, can be associated with a wide range of adverse health effects, including illness and death. Symptoms of exposure to POPs include photosensitive skin lesions, hyper pigmentation, colic, severe weakness and debilitation. Human acute exposure to dioxins and furans can occur, for example, in the occupational setting, such as herbicide production, industrial accidents, chemical fires and through burning of garbage in dump areas.

(<http://www.chem.unep.ch/pops>)



Mercury storage containers provided by the Project

3.3. Response to the United Nations Convention on Biological Diversity

Lebanon has a very rich and unique biodiversity due to its geographic location at the far eastern end of the Mediterranean Sea, its mountainous topography, and the diversity in its climatic conditions. Relative to its size, Lebanon boasts one of the highest densities of floral diversity in the Mediterranean basin.

Lebanon's rich, but fragile, ecosystem presents an intricate and complex set up for action, given extensive threats facing its biodiversity across the country. Conscious of these threats, Lebanon has ratified the United Nations Convention on Biological Diversity as early as 1995. Since then, it has benefited from international funding to address priority responses to the threats facing Lebanon's natural heritage.

MoE's cooperation with UNDP in biodiversity conservation goes a long way, as MoE obtained substantive GEF funding through UNDP in the pilot phase of GEF (as early as 1995), for the "Strengthening National Capacity and Grassroots Conservation for Sustainable Biodiversity Protection" project, which established the basis for a protected areas system in Lebanon. This was done by testing an innovative model for joint Government and NGOs collaboration in the management of three protected areas in Lebanon.

MoE also obtained funding from GEF through UNDP for the preparation of Lebanon's First Biodiversity Strategy and Action Plan (NBSAP) in 1997; the second NBSAP was prepared by MoE in 2015 with the support of UNEP, and will be published in 2016.



Shouf Biosphere Reserve
(Photo from N. Hani)



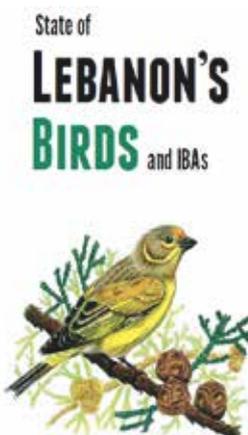
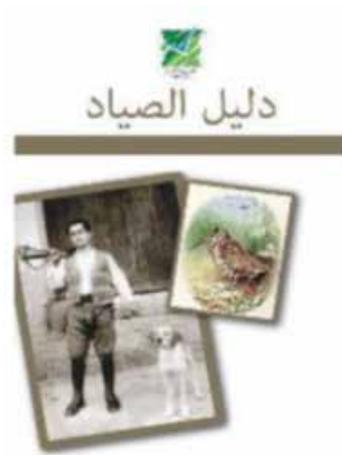
Loggerhead returning to sea after laying eggs
(Photo from G. Jaradi)

Between 2008 and 2015, Lebanon joined the regional project for “Mainstreaming Conservation of Migratory Soaring Birds (MSB) into Key Productive Sectors along the Rift Valley/Red Sea Flyway,” which obtained funding from GEF. Lebanon’s component was implemented by MoE through UNDP. The Rift Valley/Red Sea flyway is the second most important flyway for migratory soaring birds (e.g., raptors, storks, pelicans, and some ibis) in the world, with over 1.5 million birds of 37 species (including five globally-threatened species) using this corridor between their breeding grounds in Europe and West Asia, and wintering areas in Africa each year.

The overall project goal was to ensure that globally-threatened and significant populations of soaring birds that migrate along the Rift Valley/Red Sea flyway are effectively maintained. The project aimed to mainstream the conservation of soaring birds into the hunting, energy, agriculture, waste management, and tourism sectors along the Rift Valley/Red Sea flyway, making this a safer route for the birds that passed over this area.

Following the methodology set by BirdLife International, two reform sectors/vehicles were found to be eligible for the project in Lebanon, specifically the hunting sector in coordination with the Hunting Higher Council and the land-use planning sector in coordination with the Council for Development and Reconstruction; the project team developed and implemented a long-term plan for the conservation of birds in general and of Migratory Soaring Birds from hunting:

1. Prepared and implemented an extensive awareness campaign.
2. Increased national and regional capacity to effect double mainstreaming (specifically in the hunting sector and in the land-use planning sector) and application of flyway concept and ensure safe migration along the Rift Valley/Red Sea flyway. This was done through the implementation of an extensive training programme.
3. Developed, delivered, and mainstreamed content and tools to enhance flyway-friendly practices into effective sector processes and programmes. This included the following:
 - Identifying and proposing responsible hunting areas across Lebanon (presented in Section 5.4);
 - Proposing an update to the National Physical Land Use Plan (NPLP) to account for “Sensitive Birds Areas” and ensure obligatory birds protection measures to govern future projects, mainly in the energy, agriculture and construction sectors; and
 - Creating an extensive number of guides and publications, as well as technical assessments, to support the long-term management of this sector.



Publications developed under the Conservation of Migratory Soaring Birds Project

3.4. Response to the United Nations Convention to Combat Desertification

As a country heavily affected by drought and desertification, Lebanon has ratified the United Nations Convention to Combat Desertification (CCD) in 1995. Consequently, the Ministry of Agriculture (MoA) took charge of the implementation of the CCD in Lebanon in response to Lebanon's commitments to the CCD. Since then, Lebanon has been actively participating in most of the sub-regional, regional and international meetings related to the CCD.

UNDP's cooperation with the MoA started in 2003 with the prepared Lebanon's First National Action Programme to Combat Desertification in 2003. Given the desertification problem that Lebanon faces, MoE also solicited UNDP's support for developing related programmes to combat desertification, in line with its mandate and program of work and in coordination with all concerned national partners.

Safeguarding and restoring Lebanon's woodland resources

Between 2009 and 2014, MoE implemented the Safeguarding and Restoring Lebanon's Woodland Resources (SRLWR) Project with funding from GEF through UNDP. The project's overall objective was to complement on-the-ground investments from MoE's National Reforestation Program to create an enabling environment and building capacity for sustainable land management. This would serve as a contribution to greater ecosystem stability, enhanced food security and improved rural livelihoods.

The project's key results include the following:

1. An appropriate management framework and management capacities for safeguarding and restoration of degraded forest areas:

As early 2010, the SRLWR Project assisted MoE in launching its National Reforestation Programme-Phase 3. To improve implementation of this phase, the SRLWR proposed an innovative contracting modality based on contracting directly-interested municipalities to accomplish reforestation works in their respective regions, rather than contracting private firms and third parties. As such, MoE selected interested municipalities based on site selection criteria developed by the SRLWR and provided training and monitoring to the municipality staff involved in reforestation activities. Following the adoption of this new modality, MoE was able to work with the MoF to develop a new contract model for working directly with municipalities. Between 2010 and 2011, MoE contracted with 48 municipalities to conduct reforestation activities on 191 hectares of land. These projects enhanced community awareness of forest benefits, provided training on modern planting and maintenance techniques to local communities and created short- and long-term job opportunities in the villages.

2. A set of innovative technologies and instruments for the rehabilitation of forests and woodlands, and their subsequent sustainable management:

Innovative reforestation technologies were implemented in pilot areas and included methods for improved community involvement and testing novel planting practices on representative field sites for improved seedling survival at lower cost (this is further presented in Section 5.4).

3. Monitoring, learning, adaptive feedback and management:

The project conducted extensive public awareness, outreach and dissemination of innovative practices in large-scale restoration efforts, as well as continuous monitoring for improvement and adaptation of reforestation techniques. This resulted in the following:

- Creating the first undergraduate program in Forestry at the Lebanese University;
- Assisting a nature reserve committee and two monasteries in creating their own nurseries, each producing 20,000 seedlings a year;
- Capacity building through experts' visits and trainings;
- Conducting several studies, including the "Assessment of the socio-economic impact of the reforestation on the local communities" and "Assessment of the impacts of the different reforestation modalities on local communities".



*Nursery of St. Michael Monastery in Bnabil
(Photo from G. Haroutunian)*

Sustainable land management in the Qaroun Catchment

Building upon various initiatives for ecosystem management in the country, and given the need to address a pressing environmental and land degradation threats in this important area, MoE initiated the preparation of the **Sustainable land management in the Qaroun Catchment Project** in 2013 with the support of UNDP. Funding for this project was approved by the GEF through UNDP in 2014, and the project is expected to launch in 2016.

The Litani River and Qaraoun Lake are considered the most important sources of fresh water in Lebanon, with 350,000 people in 161 communities depending on the surface and groundwater resources of the river basin for drinking water. The catchment extends over an area of 1,468 km² and faces major and complex land degradation challenges.

The proposed project actions are divided into four areas: regulation, planning, enforcement and changing the production practices of sectors that are causing land degradation. These actions will be addressed through the following project interventions:

- Developing, testing, evaluating, and promoting tools, practices and measures that avoid and reduce land degradation, for example, establishing a comprehensive database as a platform for decision-making including information related to land use plans, stock carrying capacity for rangelands, forest conservation and conservation of agriculture on the plain
- Supporting an enabling planning framework modelled on an Integrated Natural Resource Management (INRM) approach, comprising Integrated Land Use Management Plans built on a foundation provided by an extensive resources survey with the data and information captured in an efficient database on a GIS platform
- Institutional strengthening through policy and regulatory reforms; capacities will be enhanced through the provision of expertise and know-how for land use planning and management for sustainability.

4. MAINSTREAMING CLIMATE CHANGE

Climate change is one of the greatest environmental challenges facing the world today. Rising global temperatures bring changes in weather patterns, rising sea levels and an increased frequency and intensity of extreme events. The affects of climate change are expected to be the highest in developing countries and will likely hit the poorest parts of the population, as they are less able to adapt to these impacts.



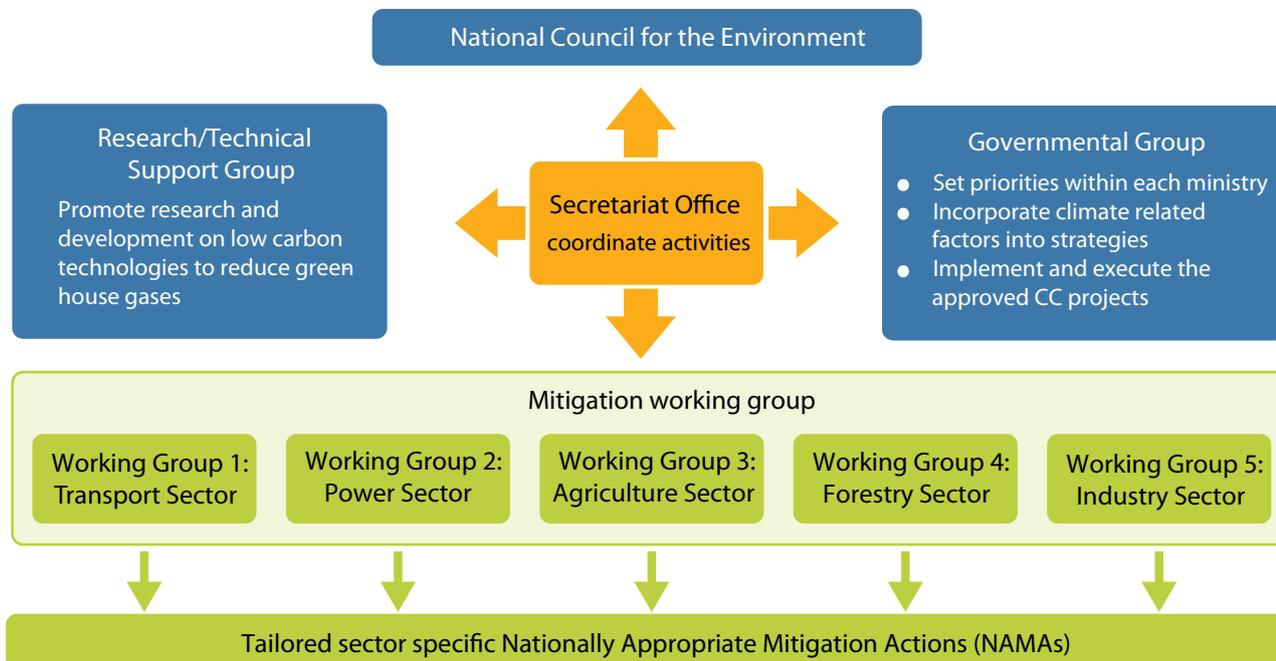
*Pilot installation of a greenhouse rainwater harvesting system in Kfarmashoun – Byblos
(Photo from V. Kabakian)*

In December 1994, Lebanon ratified the United Nations Framework Convention on Climate Change (UNFCCC) and has since been involved in various activities aimed at spreading climate change awareness in the country; reducing national greenhouse gas (GHG) emissions; developing measures to reduce adverse impacts on environmental, economic and social systems; building institutional capacity; and mainstreaming climate change into the different policies. UNDP has since been a key partner to the MoE in undertaking these activities through the Climate Change projects (CC).

The CC team (<http://climatechange.moe.gov.lb/>) has adopted a participatory approach for mainstreaming climate change in key economic sectors, including the transport, power, agriculture, forestry and industry sectors as outlined by the following:

- Projects for Reporting to the UNFCCC
- Lebanon's Low Emission Capacity Building Programme (LECB)
- Mainstreaming Climate Change into Lebanon's Development Agenda Project

These projects support increasing policy coherence, minimizing duplications and contradictory policies and capturing opportunities for sectoral development by introducing a proper governance regime in Lebanon that would lead to the development of low emission climate resilient strategies. For this, coordination mechanisms involving strategic planning, effective communication and appropriate financial mechanisms are strengthened and governmental institutions are engaged in planning and implementing effective national adaptation activities. Additionally, the CC projects provided support to shape Lebanon's position under the UNFCCC negotiations, including leading the negotiations.



4.1. Reporting to the United Nations Framework Convention on Climate Change

As Non-Annex I Party of the UNFCCC, Lebanon is obligated to report the steps undertaken or envisaged to implement the provisions of the UNFCCC through National Communications, which is a periodic reporting to the Convention and includes information related to the national Greenhouse Gas (GHG) emissions and removals, mitigation options analysis, vulnerability to climate change, adaptation options, gaps and constraints in implementing the provisions of the Convention and any other relevant information the country wishes to communicate. The entire process is controlled by specific guidelines developed by the UNFCCC. To date, the following national reports have been prepared with the support of the UNDP CC projects:

- Lebanon's Initial National Communication (INC) to the UNFCCC as early as 1999 with funding from GEF
- Lebanon's Second National Communication (SNC) to the UNFCCC prepared in February 2011 with funding from GEF. In comparison to the INC, the SNC report contains new chapters, actions, policies, measures and an early stage set of adaptation actions to prepare Lebanon for the unavoidable consequences of climate change
- Lebanon's Third National Communication (TNC) to the UNFCCC initiated in 2013 with funding from GEF, and comprised of the updated national greenhouse gas (GHG) inventory, as well as mitigation, vulnerability and adaptation analysis and policy recommendations

Lebanon's Third National Communication is expected to be published in 2016 and will include the following key aspects that support Lebanon's commitments towards the UNFCCC:

- Updated Lebanon's greenhouse gas (GHG) national inventories for the year 2012 and time-series covering the period from 1994–2012 for the agriculture, energy, transport, waste, industrial and land-use, land-use change and forestry sectors;
- Updated analysis of potential GHG mitigation measures and progress achieved so far;
- Economic assessment of potential impacts of climate change on food security, social development, tourism and poverty; and
- Proposed adequate adaptation measures.



Lebanon's Second National Communication to the UNFCCC was published in 2011.

According to Lebanon's Second National Communication to the UNFCCC, which was prepared in 2011, Lebanon is already facing, and will continue to face, several challenges as a result of climate change. Temperatures are expected to increase by around 1°C on the coast and 2°C in the mainland by 2040, and by 2090 they will be 3.5°C and 5°C higher. At the same time, rainfall is projected to decrease by 10–20% by 2040 and 25–45% by the year 2090. This will lead to substantial detrimental effects in a number of areas, specifically at the level of biodiversity and forestry resources, as well as in the agriculture and water sectors.

Regarding Lebanon's Green House Gas (GHG) emissions, although they only represent 0.07% of global GHG emissions, reducing these emissions constitutes a commitment to the global community, but also provides national benefits for Lebanon. The most recent account of national GHG emissions and sinks—according to Lebanon's Biennial Update Report, which was prepared in 2015—indicates a gross emission of CO₂eq. This amounted to 24,652 Gg CO₂eq. with the most significant greenhouse gas being carbon dioxide, primarily produced from the burning of fossil fuels. The main contributor to greenhouse gas emissions is the energy sector with 74% of GHG emissions, followed by the waste sector (11%) and industrial processes (10%). CO₂ removals from the land-use, land-use change and forestry category amounted to 3,369.85 Gg CO₂, bringing Lebanon's net emissions down to 21,283 Gg CO₂eq.

Lebanon's GHG emissions have increased by 33.7% since 1994, which represents an average annual growth rate of 1.9%, making it essential to adopt the following mitigation measures for these different sectors:

- Implementing the Electricity Policy Paper of the Ministry of Energy and Water (MoEW);
- Increasing power generation efficiency in industries;
- Developing thermal standards for buildings;
- Revitalizing the public transport system in Lebanon;
- Implementing car scrappage programme; and
- Increasing additive blend in cement production

Given that major economic sectors are concerned with mitigation and adaptation efforts related to climate change, there is a crucial necessity to mainstream climate change concepts into national and sectoral development plans and establish an organized and effective national coordination system among all concerned stakeholders.

Through the UNDP CC projects and with funding from the GEF, the preparation of **Lebanon's First Biennial Update Report (BUR)** to the UNFCCC was completed and submitted in October 2015. The Biennial Update Report includes an updated greenhouse gas (GHG) national inventory and information on the emission reductions of the various mitigation actions undertaken in the country, as well as information on the domestic Measuring, Reporting, and Verifying (MRV) system. It also highlights national financial and capacity development climate change needs.

The CC projects initiated the preparation of **Lebanon's Intended Nationally Determined Contribution (INDC)** in 2015. This was done in response to the 19th Conference of Parties (COP 19) in Poland that called upon the development of Intended Nationally Determined Contribution (INDC) as a way to dissolve the developed/developing party binary system. It was also done to encourage all the Parties members of the UNFCCC to contribute to the reduction of GHG in order to avoid crossing the 2°C threshold to prevent dire climate change impacts. The INDC's logic is that each country determines its own contribution according to national circumstances, through a bottom-up approach. Countries can also choose to add an adaptation component in their INDC. Lebanon submitted its INDCs by October 1st, 2015 in order for it to be included in the negotiations of the 21st Conference of Parties (COP21), which was held in Paris in December 2015.



In preparation for Lebanon's Third National Communication to the UNFCCC, sectoral reports were prepared and published.



Lebanon has actively participated in all COP of the UNFCCC.

Lebanon's Intended Nationally Determined Contribution (MoE/UNDP, 2015)

Countries taking part in the international climate negotiations, including Lebanon, have agreed to publish the actions they intend to take under a global agreement to sign at the Paris Climate Summit in December 2015. These countries' commitments are known as Intended Nationally Determined Contributions, or INDCs. Released in September 2015, Lebanon's INDC summarizes the country's pledges and targets related to voluntary GHG emission reduction, and was developed based on extensive stakeholder involvement. Mitigation and adaptation actions considered in the development of the INDC targets were selected using a bottom-up approach, employing existing sectorial plans and strategies as a basis. This approach included the most appropriate mitigation and adaptation actions for each sector and ensured full support from sectorial stakeholders. The INDC includes actions that Lebanon is able to implement without additional international support, as well as actions indicated under the unconditional scenario and further mitigation and adaptation actions, which can be implemented upon the provision of additional international support.

4.2. Lebanon's Low Emission Capacity Building Programme

In 2013, Lebanon's Low Emission Capacity Building Programme (LECB) was initiated by UNDP in partnership with MoE and with funding from the Australian Government, the European Union and the Germany Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety.

The programme aims to improve Lebanon's relevant infrastructure, institutional capacities, information sharing, and coordination processes to develop the required capacities to achieve low emission development. This will be accomplished through the following actions:

- Development of greenhouse gas (GHG) inventory management systems;
- Identification of opportunities for Nationally Appropriate Mitigation Actions (NAMAs);
- Design of systems for Measuring, Reporting and Verification (MRV) of proposed actions and means to reduce GHG emissions;
- Development of a de-risking scheme for both utility scale and decentralised renewable energy technologies; and
- Design of Low Emission Development Strategies (LEDS) in the context of national priorities.

By 2015, Lebanon's Low Emission Capacity Building Programme accomplished the following:

- Conducted prioritization and selection of NAMAs in Lebanon;
- Supported the issuance by the Council of Ministers of Decision 44 of January 17, 2013 designating MoE as the national coordinator of the NAMA process in Lebanon and the adoption of the Ministerial Decision 196/1 of July 18, 2014 for indicating the steps to the NAMA mechanism;
- Launched two NAMA projects for the waste and transport sector in tandem with the development of an MRV system after a diligent prioritization process with stakeholders, and provided support to the MoA in their preparation of a Forestry NAMA;
- Engaged the private sector in reporting their GHG as per MoE decision 99/1 of April 11, 2013 for the third year in a row in order to have a more complete

and accurate inventory and succeeded in having the MoE and the Mol sign a Memorandum of Understanding (MoU), as part of enhancing institutional arrangements for data sharing; and

- Devised several procedures and approaches (e.g. NAMA prioritization and MRV schemes) that were showcased as international best practices



Memorandum of Understanding between MoE and Mol in 2014 in support of Lebanon's Low Emission Capacity Building Programme



Award Ceremony for Private Sector Institutions Reporting their Greenhouse Gas Emissions in 2015

4.3. Mainstreaming Climate Change into Lebanon's Development Agenda Programme

In 2013, the CC team launched a national project for **Mainstreaming Climate Change into Lebanon's Development Agenda** with funding from the Lebanon Recovery Fund.

The project aims to support the Lebanese Government in its efforts to move towards a low carbon economy, as well as provide a directive for national adaptation activities leading to a coordinated national low emission climate resilient development strategy. The project has been structural in engaging public institutions in continuous planning/decision making on climate change issues, and established the Climate Change Coordination Unit Committee (CCCU), which is a committee composed of over 40 representatives from ministries, governmental institutions, academia, non-governmental organizations and the private sector. The CCCU meets periodically to mainstream climate change in the national development agenda.

Overall, the project succeeded in building national capacity on planning sectoral strategies while taking into consideration climate change, specifically at the level of the MoE, MoF, MoA, Lebanon's Meteorological Stations and Lebanese Agricultural Research Institute (LARI). It also mainstreamed climate change concepts in schools by developing a Teachers' Guide and building partnerships with the private sector (such as the partnership with the IPT Energy Center). Additionally, the project worked on building regional and global partnerships to strengthen resilience to climate change through initiatives such as Climate Vulnerable Forum, Climasouth Project and Adaptation to Climate Change in the Water Sector in the MENA Region Programme (ACCWAM).



Pilot project on rainwater harvesting from Greenhouse Tops



Training in Advanced UNFCCC Negotiations to Lebanon's Climate Change Coordination Unit Project

By 2015, the project achieved numerous outputs, including the following:

- At the level of the CCCU members, the project provided trainings to the members to enhance their capacities in climate finance, cost-benefit analysis and cost-effectiveness analysis, de-risking climate investments, negotiations' simulation and effective writing skills and launched the "Institutional Mapping of National Climate Change Related Activities," which identified the key national actors, funds and activities, and, consequently, the gaps to be filled. The project also developed guidelines on Climate proofing of EIAs.
- At the policy level, the project concluded the Technology Needs Assessment (TNA) for policy-makers to provide for a more direct decision-making process, launched a "Fossil Fuel Subsidies in Lebanon" study that will propose a fossil fuel phasing-out roadmap over a 10-year period for both the electricity and transport sectors, conducted an assessment on "Climate Finance Loan Schemes in Lebanon" that summarizes the existing loans schemes, eligibility criteria, and how these plans can enhance investments in renewable energy and energy efficiency, and conducted a report on "Opportunities for Climate Change Policies and Climate Finance in Lebanon," which assesses how a Low Emission Development Strategy (LEDS) can help achieve a range of national priorities. Moreover, the project successfully engaged the MoF and secured their effective participation in several regional meetings of the Green Climate Fund in Egypt and the Low Emission Capacity Building project in Costa Rica and Ghana, ensuring the mainstreaming of climate change in the MoA's work plan and supporting the provision of training on seasonal weather/climate forecasting and early warning systems for LARI and Lebanon's Meteorological Stations (LMS). The project supported the Government of Lebanon in hosting the MENA CVF regional conference (refer to <http://www.thecvf.org/mena-countries-agree-14-points-to-tackle-climate-change/>).
- At the level of Renewable Energy (RE) technologies, the project conducted a study to determine the mix of technologies for meeting Lebanon's 12% RE 2020 target with the least macroeconomic impact in the "Optimal Renewable Energy Mix of the Power Sector by 2020," and completed the Strategic Environmental Assessment for Lebanon's Renewable Energy Sector.
- At the level of the transport sector, the project concluded the "Mobility Cost" case study for Lebanon that calculates the full cost of mobility in Lebanon, primarily ownership and operating costs and the "Automobile Scrapping Scheme," which lists the available opportunities and recommendations for scrapping in Lebanon. It also launched a "Transport sector in Lebanon: Fiscal Incentives/Disincentives for Greenhouse Gas Mitigation Scenarios" study, which aims to complement the mitigation scenarios under the Third National Communication (TNC).
- At the level of piloting of technologies, the project concluded the Rainwater Harvesting from Greenhouse Tops pilot along with the guidelines to replicate the technology's implementation, as recommended by the Technology Needs Assessment (TNA).

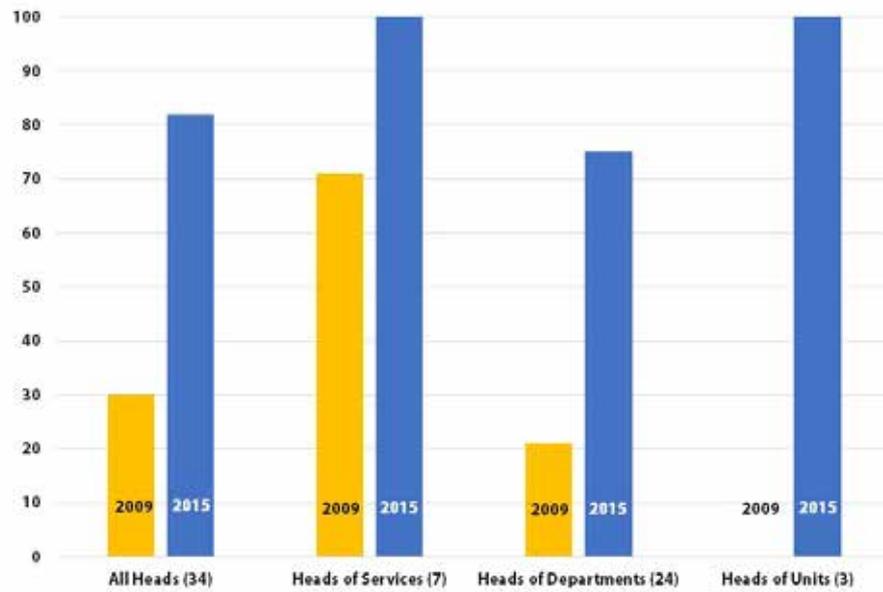
5. KEY ACHIEVEMENTS OF THE MOE/UNDP COOPERATION

Building on the on-going collaboration between MoE and UNDP in past years and, specifically, on the activities the various projects implemented since 2010, the following sections provide selected highlights of the achievements and impact of this cooperation. The examples provided in this section do not provide an exhaustive list of all achievements, but offer a spectrum of the key results that were attained.

5.1. Strengthening MoE's Staff at the Decision-Making Level

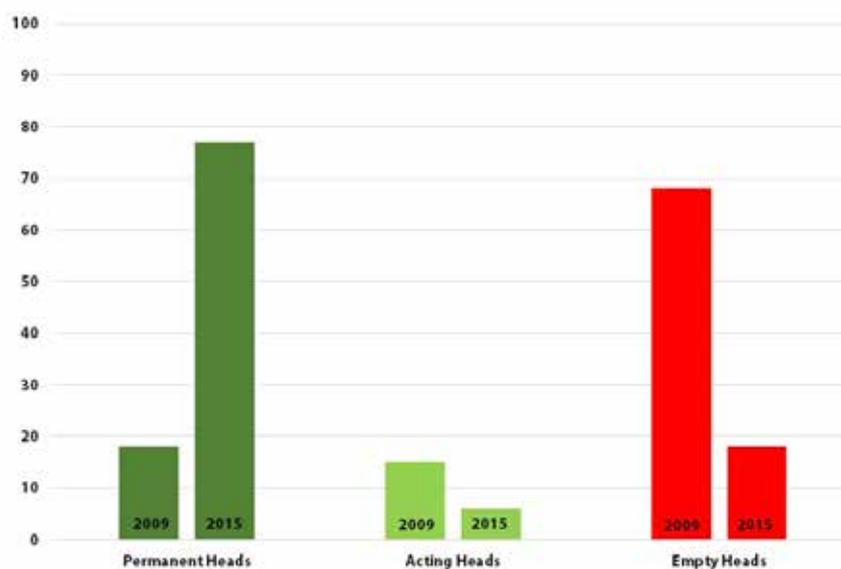
Although it has proven very challenging to address the overall trends in staffing of MoE since 2010 due to high turnover rates of staff and slow recruitment processes, two important aspects resulting from the support provided by UNDP can be highlighted as follows:

1. Between 2010 and 2015, it has been possible to fill vacant senior positions at MoE and reach a rate of 82% of occupancy (for all senior positions) compared to only 30% in 2009. This allowed an increase from zero to 100% occupancy for the position of heads of Units, from 21% to 75% for heads of Departments and from 71% to 100% for heads of Services (as shown in the Figure below and in the MoE organigramme below). This aspect is specifically important in strengthening the institutional basis and the decision-making processes at MoE, and ensuring the institutional anchoring of the cooperation with UNDP and other international agencies and donors.



Rates of heads of services, departments, and units between 2009 and 2015

2. It was also possible to significantly strengthen the presence of permanent staff at the level of heads of MoE and thus, the sustainability of the MoE's staffing; whereby an increase in the rates of permanent heads from 18% in 2009 to 76% in 2015 was achieved. Although some of the senior positions are still operating on an "Acting" basis, it should be noted that such temporary arrangements have dropped from 15% in 2009 to 6% in 2015 (as shown in the Figure below and in the MoE organigramme below).

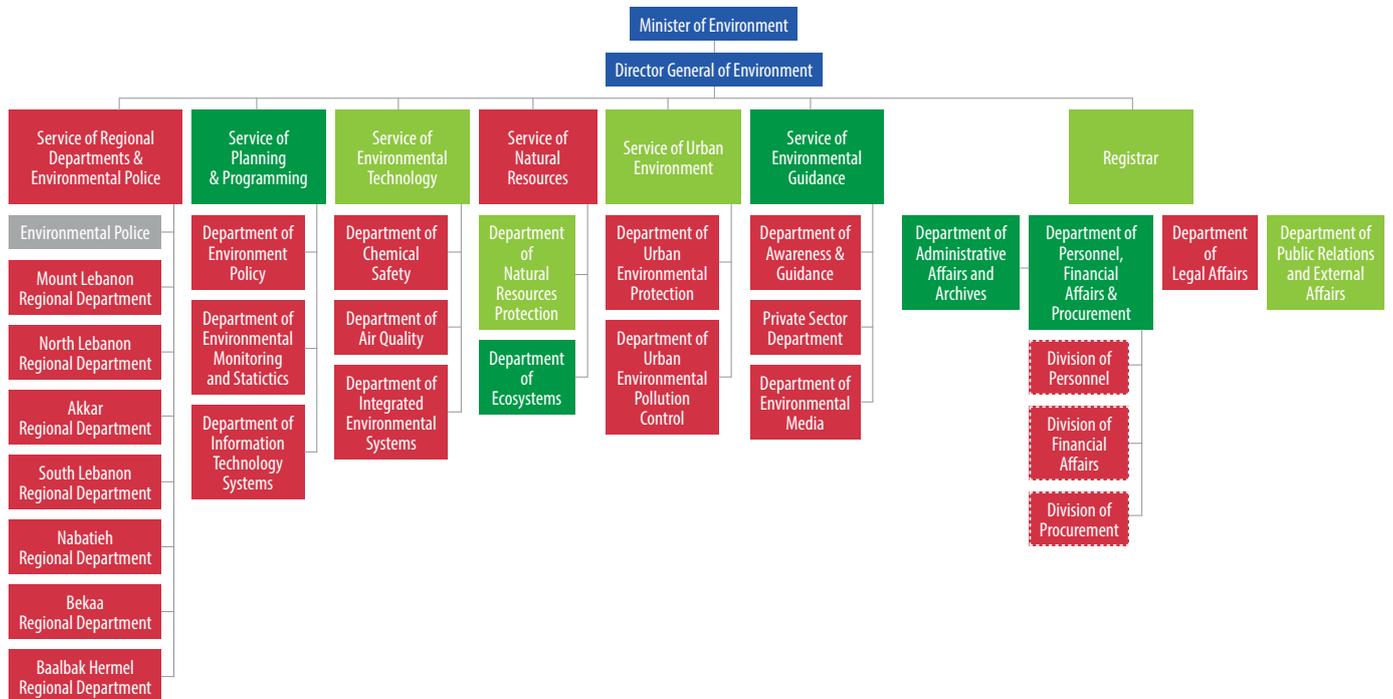


Rates of positions of permanent, acting, and empty heads between 2009 and 2015

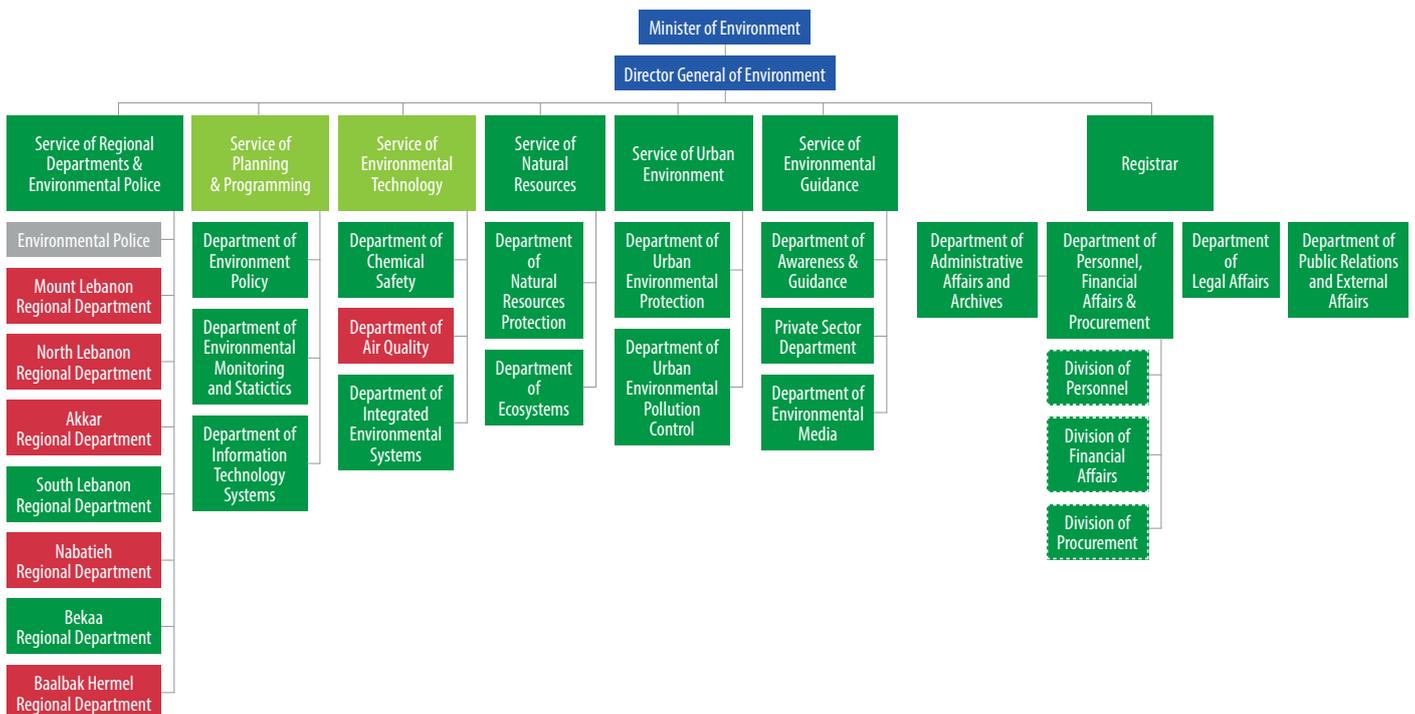
3. MoE is currently functioning on the basis of only 46 technical staff members out of the 118 technical positions planned under its mandate (i.e. a gap of 61% of its original needs). UNDP supported the MoE in recruiting an additional 27 technical staff, which, once the appointment decree is approved by the Council of Ministers, would reduce the gap to 38%. In the meantime, UNDP's professional staff is complementing some of MoE's functions, working to provide advisory and technical support to the concerned services of MoE.

Increase in number of heads of services, departments, and units from 2009 and 2015

In 2009



In 2015



Changes in MoE's organigramme at the level of heads of Services, Departments, and Units

Legend: Dark green: Filled position with permanent staff, Light green: Filled position with acting staff, Red: Vacant position

5.2. Legal Reform at National and International Levels

In addition to strengthening the institutional capacity of MoE, the MoE/UNDP cooperation supported the legal framework for environmental management in Lebanon, focusing on the development and enforcement of priority legal text and procedures at the national level. In this context, the major breakthrough in the legal reform that started a new page in environmental management in Lebanon can be attributed to the approval of crucial laws and application decrees, called upon under the Environment Protection Law (Law 444/2002), including:

- Law for the Designated Attorneys for the Environment (Law 251/2014), which has been accompanied by the official appointment of the Designated Attorneys, the Investigation Judges, and the Court Environmental Experts;
- Application Decree for the Strategic Environmental Assessment (Decree 8213/2012);
- Application Decree for the Environmental Impact Assessment (Decree 8633/2012);
- Application Decree for the Environmental Compliance for Establishments (Decree 8471/2012); and
- Application Decree for the National Council for the Environment (Decree 8157/2012).

Other key draft laws and application decrees are being moved forward with UNDP's support and include the following:

- Draft Law for the Protection of Air Quality (approved by the CoM in January 2012);
- Draft Law for the Protected Areas (approved by the CoM in January 2012);
- Draft Law for the Integrated Solid Waste Management (approved by the CoM in January 2012);
- Draft Application Decree for the Organization of the Environmental Police;
- Draft Application Decree for the National Environmental Fund;
- Draft Decree amending the ODS Decree 2604/2009; and
- Draft Application Decree to compensate the members of the National Council for the Environment.

UNDP also supported the development and issuance of key Ministerial Decisions and Memos for strengthening environment governance, including the following:

- EIA, IEE and SEA review procedures;
- EIA and IEE appeal procedures;
- Documentation related to urban planning in EIA and IEE reports;
- Qualification criteria of consulting firms conducting SEAs, EIAs, IEEs and Environmental Audits;
- Procedures for the registration of EIA and IEE reports;
- Procedures for environmentally clearing industrial licensing requests;
- Decisions for the implementation of the Compliance decree, including compliance deadlines; and
- Decisions for the designation of MoE as the national coordinator of the NAMA process in Lebanon and establishment of related steps to launch the NAMA mechanism

At the international level, UNDP's support has been crucial for the ratification of priority legal procedures related to international conventions, including the following:

- Amendments to the Basel Convention (adopted by Law 29/2015);
- Protocol on Integrated Coastal Zone Management in the Mediterranean under the Barcelona Convention (adopted by Decree 639/2014);
- Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization under the Convention on Biological Diversity (approved by the Council of Ministers in July 2014); and
- Facilitation and follow up for the adoption of needed legal procedures related to Lebanon's commitments to the international conventions in the areas of biodiversity conservation, protected areas management, and hunting.

Finally, "a major breakthrough" for Lebanon, as described by Lebanon's Permanent representative to the UN in 2014, was achieved by adopting the UN General Assembly Resolution 69/212 on "Oil Slick on the Lebanese Shores" (from the oil spill which resulted during the Israeli war on Lebanon in 2006) which "Acknowledges the conclusions in the report of the Secretary-General, in which he stated that studies show that the value of the damage to Lebanon amounted to 856.4 million USD in 2014. . .and reiterates its request in this regard to the Government of Israel to assume responsibility for prompt and adequate compensation to the Government of Lebanon for the aforementioned damage." This resolution, which was voted on by a majority of 170 states out of the 193 members of the UN General Assembly, was based on the UN Secretary General's report that was prepared by UNDP in consultation with UNEP. This resolution was re-emphasized through the UN GA resolution 70/194 of December 2015.

Lebanon's 2006 oil spill

During the July 2006 Israeli war on Lebanon, an air strike hit the fuel storage tanks of the Jiyeh power plant, Beirut's main electricity generating plant located around 30 km south of the capital. Approximately 15,000 tons of heavy fuel oil escaped into the sea, spreading northwards along 100-120 km of the Lebanese coastline.

Surveys and assessments of the affected areas showed that many touristic beaches, marinas, fishing and commercial ports became heavily contaminated. This oil spill had serious implications on human health, marine life, fisheries and tourism, and affected the national economy. The oil spill was considered Lebanon's worst environmental disaster.



5.3. Resource Mobilization and Partnerships Building

Based on the sectoral studies and assessments, it was possible for MoE—with UNDP's support primarily through the Project of the Institutional Support for MoE—to mobilize extensive resources in a strategic approach for addressing environmental priorities. This included the following:

- Cooperation with the European Union covered a total amount of around EUR 27 million through the Support to Reforms-Environmental Governance (StREG) Programme and the Protection and Sustainable Development of Maritime Resources in Lebanon (PROMARE) Programme;
- Cooperation with the Italian Cooperation covered a total amount of around EUR approximately 8 million through the Baalbeck Solid Waste Project, the Solar Water Heating (SWH) Project, the LEPAP technical assistance component and the Hydropower project (a project for the MoEW, in close cooperation with MoE); and
- Cooperation with the World Bank covered a total amount of around USD 73 million through the Institutional Development Fund (IDF) grant for environmental compliance, the Technical Assistance through the Regional Governance and Knowledge Generation (ReGoKo) Project, the Poly-Chlorinated Biphenyls (PCBs) Project, the Investment component of the LEPAP Project and the Lake Qaraoun Pollution Prevention Project.

For the Litani River and Qaraoun Basin, several sources of funding have been mobilized through the MoE/UNDP cooperation and include: a draft 732 million USD budget law at the Parliament; establishment of a Qaraoun Basin committee (CoM decision 32 of 9 May 2014) and supporting its monthly meetings as well as the 6-months reporting to the Council of Ministers; support for the development of a project loan of 55 million USD from the World Bank targeting mainly wastewater and governance; and mobilization of a grant of 3.2 million USD from the Global Environmental Facility through UNDP for "Sustainable land management in the Qaraoun watershed."



Qaraoun Lake

Moreover, efforts are under way for the mobilization of additional resources for environmental management in Lebanon. These include support for the preparation of the Food and Agriculture Organization FAO/GEF Project for the Sustainable Agricultural Livelihoods in Marginal Areas (SALMA) and the Italian Cooperation Project for Sustainable Tourism and Environmental Planning (STEP).

The MoE and UNDP cooperation has also allowed the preparation of important studies and assessments that provided an important basis for strengthening the principles of sustainable development in key sectors in Lebanon, including the following:

- Cooperation with International Labor Organization (ILO) in 2011 in the preparation of the "Assessment of Green Jobs in Lebanon" covering four main sectors in Lebanon;
- Cooperation with the WB in 2011 in the preparation of Lebanon's "Country Environmental Analysis";
- Cooperation with United Nations Environment Programme (UNEP) in 2012 in the preparation of the "Sustainable Public Procurement Action Plan for Lebanon", which included an assessment of the "Public Procurement Legal Framework in Lebanon and Possibilities for Incorporating Environmental and Social Sustainability Criteria"; and
- Cooperation with the WB in 2015 in the preparation of the "Strategic Environmental Assessment of the National Water Sector Strategy."

5.4. Technical Edge and Know-How in Specific Fields

Although many of the MoE/UNDP cooperation initiatives have succeeded to sustain a long-term development of their efforts, in the case of projects that have been completed, an important contribution has been brought forward and documented to support the continuation of efforts related to these interventions. Two examples are provided in this section, although many others can be reported.

Reforestation techniques

The centrepiece of the SRLWR Project was its second objective that aimed to test new reforestation techniques at pilot sites. None of these techniques was previously assessed in Lebanon. Three successive sets of trials at seven different pilot sites were implemented. Each set built on the lessons learned from the previous set. The goal was to develop techniques to be used in future large-scale land rehabilitation activities. This is the first era of novel reforestation techniques in Lebanon since the Green Plan effort in the 1960s. Due to the fact that the results of those early efforts were not published at the time and/or were mostly lost during the Civil War, these new field trials are expected to have an important impact on the improvement of Lebanon's reforestation practices. The main objectives of the trials were cost reduction and survival increase. Through the three sets of trials, the project studied possible ways to decrease planting costs from the actual cost of \$7,000/ha to \$1,500/ha by:

- Minimizing irrigation water use
- Using smaller plants
- Using direct sowing of seeds where possible
- Evaluating the possibility of no-irrigation reforestation in Lebanon

Sites were selected to represent a diverse range of growing conditions and elevations, as well as represent the Mediterranean bioclimatic zone that was most suitable to establish a specific forest species along with abiotic factors (e.g., climate, soil, topography) that would encourage seedling survival. Set 1 sites were clustered in the Bekaa valley, and sites in Sets 2 and 3 were more widely distributed along the western slope of the Western Lebanon Mountain Range (refer to the sites map below).

The detailed methodology, results, and recommendations are captured in the Technical Report. The trials advanced the potential for no-irrigation reforestation, minimal water use, and seed sowing. Some gaps still prevail in knowledge about seed sowing on silt-clay soils and seed germination. The comparison of seedling ages gave inconclusive results, but in general, non-irrigation of seedlings was just as effective for survival as using water supplements. The Technical Report also provided a number of recommendations to best capture results of the SRLWRP to benefit long-term reforestation practices in Lebanon. It covered direct sowing of seeds, planting seedlings, irrigation and water supplements; soil texture; soil preparation; and follow up on project data and findings.



Trial pilot sites of the reforestation programme

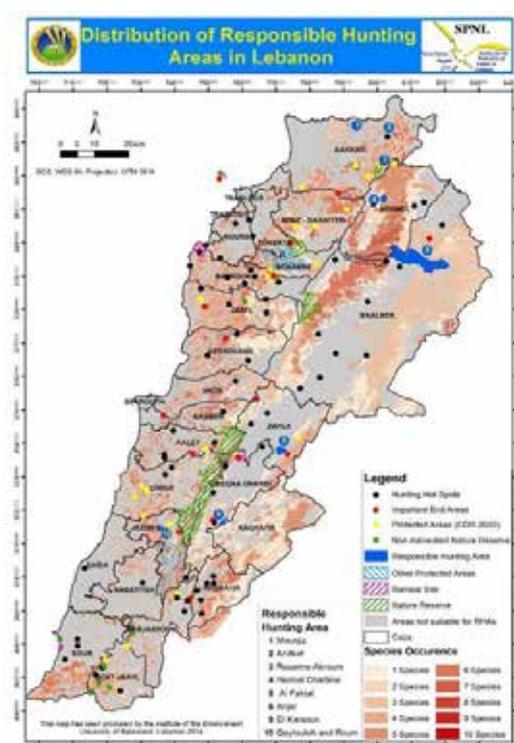


View of Arz-Bcharre trial site (Photo from G. Haroutunian)

Responsible hunting areas

Under the project for the Conservation of Migratory Soaring Birds, a set of 10 Responsible Hunting Areas (RHA) were identified across Lebanon and officially published in 2015. The RHA were mapped at national level (see map below) and detailed maps were developed for each RHA.

This was carried out based on a RHA selection methodology, taking into account the huntable species according to the Higher Hunting Council, and assigning a national status, distribution and preferred habitat to each of these species. Extensive field research was conducted to confirm that the sites respond to the set criteria, including the number of game bird species occurring in it. Through this assessment, the project was able to document and publish updated status of birds in Lebanon and highlight the presence of a number of globally threatened soaring bird species in Lebanon such as Dalmatian Pelican, Greater Spotted Eagle, White-tailed Eagle, Egyptian Vulture, Pallid Harrier, Imperial Eagle, and the Lesser Kestrel. The project has thus stressed the importance of Lebanon on an international scale as a flyway for migrating soaring birds as well as a refuge for 140 of birds species, which have been recorded to be breeding in Lebanon.



Proposed distribution of responsible hunting areas in Lebanon

5.5 Communication and Outreach Products

All MoE/UNDP initiatives have included an important component for developing communication and outreach plans and tools. This section provides examples of some of the communication and outreach tools produced as part of the wealth of products developed in the past years under the MoE/UNDP activities, and which can be further used in the future.

Most of the communication and outreach tools **produced between 2010 and 2015** are available at the MoE website (www.moe.gov.lb) and/or the UNDP-Lebanon's website (www.undp.org.lb), while others are posted on the individual websites of the specific projects under which they were developed.

Among these tools, **brochures and information booklets** are considered a standard practice and are available for most projects. Since April 2012, the Climate Change Office issued a monthly Newsletter: "**Climate Change Connection**," which provides continuous updates on the progress towards meeting Lebanon's obligations to the UNFCCC.

A Citizen 's Guide to Climate Change provides information on climate change and its impact on the environment and human health in a non-technical and illustrative way. It also provides tips and tricks on what can be done on an individual basis to reduce greenhouse gas emissions and adapt to a changing climate.



Safeguarding and restoring Lebanon's Woodland Resources Project produced technical illustrated booklets on the native trees of Lebanon in Arabic and English.



Documentaries and Television spots were also prepared by many of the projects, and these include:

- **The IS MoE documentaries** include "Rio +20," "Artificial Reef," "Climate Change Mitigation – Renewable Energy" (Solar Water Heaters) and "MoE 2011-2013 Achievements." The project also prepared a TV spot on the "New Year Environmental Resolutions" in 2012/2013.
- **The Environmental Resources Monitoring in Lebanon Project** prepared a documentary about its achievements in English and Arabic.
- **The Saida Dumpsite Rehabilitation Project** prepared a documentary about the "Rehabilitation of the Saida Dumpsite."
- **The Ozone Project** prepared a video on ozone protection.
- **The Climate Change projects** prepared a series of videos posted on YouTube.
- **The Project of the Conservation of Migratory Soaring Birds** prepared several TV spots on the conservation of soaring birds.

Overall, extensive environmental awareness-raising activities were continuously launched by the MoE/UNDP initiatives and are considered a backbone of the projects. The following are representative samples of the types of campaigns launched in the past years.

- **The ISMOE project** conducted campaigns for most environmental occasions, including the celebration of key environmental dates (e.g., MoE Anniversary April 2nd; World Environmental Day June 5th, National Environment Day November 16th); roundtables and ceremonies for priority environmental issues; distribution of the first National Green Awards (2013) for public and private stakeholders, as well as NGOs, schools and youth (based on a competition for the schools and youth category); and specialized Communication Campaigns such as the SOER Dissemination campaign (2011) and 1-year Energy Saving Campaign (2012-2013).
- **The Conservation of Migratory Soaring Birds** prepared and disseminated a song with a video spot and replication of DVD.

The Project of Environmental Resources Monitoring in Lebanon developed a continuous campaign on MoE's website, providing a real-time air quality index with the slogan of "Help Camil the Chameleon stay Green".



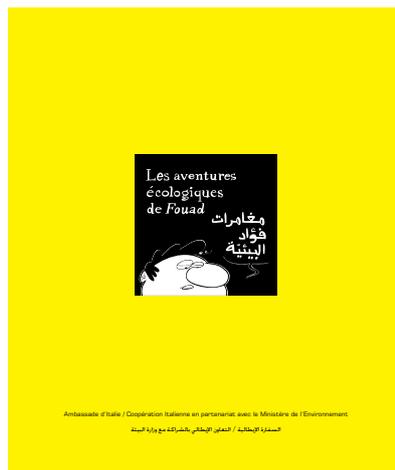


The Ozone Unit project launched a campaign on "Protection Cars Sunshade" in 2010 and for UV Wristbands in 2014 (Photo from M. Hussein)

- The Climate Change projects launched a campaign for the appointment of a "Climate Change Champion": a person who works closely with UNDP Lebanon to raise awareness about climate change through several events throughout the year. In addition, the CC projects partnered with Annahar newspaper through its online platform to provide daily climate change articles on Naharnet: <http://www.naharnet.com/climate-change-environment>. It also disseminated the Fouad Comic Strips on energy efficiency in 2012-2013 across several newspapers and compiled them in an agenda.



Fouad Comic Strip



6. THE WAY FORWARD

The MoE/UNDP cooperation continues to evolve towards a long-term partnership for achieving sustainable development in Lebanon.

Just as “Success is the sum of small efforts, repeated day-in and day-out” (Robert Collier), success of the MoE/UNDP cooperation is the result of small and sustained efforts, that work towards safeguarding Lebanon’s fragile environment and natural heritage.

The way forward will therefore continue on the same basis to achieve more results. This will be directed towards the following key pillars:

- Strategic planning for environmental mainstreaming: through on-going planning processes such as the National Sustainable Development Strategy (NSDS), Lebanon’s Intended Nationally Determined Contribution (INDC), Lebanon’s HCFC Phase-out Management Plan and others, it will be possible to identify national sectoral targets for sustainable development interventions in all sectors (e.g., energy, agriculture, transport, water). The MoE/UNDP approach for validating the proposed targets is based on a consultative approach involving concerned national institutions and ensuring their feedback in setting the targets to be included in the strategies and plans, building upon existing strategies and policies.
- Legal framework for environmental mainstreaming: a rigorous and comprehensive application of the legal framework constitutes an effective mainstreaming tool through the Strategic Environmental Assessment, the Environmental Impact Assessment, and the Environmental Compliance decrees. The implementation of these legal instruments, together with the development and enforcement of other legal procedures, will continue to be a priority for adopting sustainable development approaches in Lebanon.
- Technical know-how and innovation: UNDP’s knowledge and experience at the global level will continue to bring a value added to the MoE/UNDP cooperation and allow the adaptation and adoption of this know-how at the national level. Through specialized and focused in-depth assessments, the identification of innovative technologies will be pertinent and will lead to replication and eventual adherence to sustainable approaches.

LIST OF PUBLICATIONS

IS MoE Project

- State & Trends of the Lebanese Environment, 2011 (in three languages)
- Business Plan for Combatting Pollution of the Qaraoun Lake, 2011
- Master Plan for the Closure and Rehabilitation of Uncontrolled Dumps, 2011
- National Report to the UN Rio +20 Conference on Sustainable Development, 2012 (in English and Arabic)
- Lebanon Environmental Assessment of the Syrian Conflict and Priority Interventions, 2014 (EU funded)

ERML Project

- Air Quality Assessment in Lebanon: Current Situation and Opportunities for Improvement Report, 2012
- Identification of Air Pollution Hotspots and Development of a Monitoring and Reporting Programme for Lebanon Report, 2012
- Analysis of the Institutional and Legal Frameworks of Monitoring and Management of Air Quality in Lebanon Report, 2012
- Identification and Assessment of Coastal Sensitive Areas in Lebanon Report, 2012
- Ecosystem Based Monitoring of the Coastal and Marine Environment in Lebanon Report, 2012
- Institutional and Legal Frameworks of Monitoring and Management of Coastal and Marine Areas Report, 2012
- Situational Analysis of the Current Land Use of the Coastal Zone in Lebanon: Land Cover Land Use Changes and Socio-Economics in the Coastal Area of Lebanon Report, 2012
- Land Use Strategy for Lebanon: A proposal Integrating Green Economy opportunities Report, 2012

Safeguarding and Restoring Lebanon's Woodland Resources Project

- Safeguarding and Restoring Lebanon's Woodland Resources. Technical Report, 2014

Conservation of Migratory Soaring Birds Project

- Status of Lebanon's Birds and Important Birds and Biodiversity Areas (IBAs), 2014
- Field Guide to the Soaring Birds in Lebanon, 2014
- Bird Identification Manual, 2014
- Soaring Birds Atlas Lebanon, 2014
- Hunter's Guide, 2014 (in Arabic)
- Hunting Exam Guide, 2014 (in Arabic)

Climate Change Office

- NAMA guide, 2013
- Debunking NAMAs, 2014
- Low Emission Capacity Building Programme – Lebanon: Voices from the Field, 2014
- Required Information by the National Coordinating Authority – MoE for Nationally Appropriate Mitigation Actions Requesting Support for Preparation, 2014
- Required Information by the National Coordinating Authority – MoE for Nationally Appropriate Mitigation Actions Requesting Support for Implementation, 2014
- Climate Finance Loan Schemes: Existing and Planned Loan Schemes in Lebanon, 2014
- National Greenhouse Gas Inventory Report and Mitigation Analysis for the Land-Use, Land-Use Change and Forestry Sector; the Agriculture Sector; the Transport Sector; the Waste Sector; the Energy Sector; and for the Industry Sector, 2015
- Strategic Environmental Assessment (SEA) for Lebanon's Renewable Energy Sector, 2015
- National Guidelines for Greenhouse Rainwater Harvesting Systems in the Agriculture Sector, 2015
- Optimal Renewable Energy Mix of the Power Sector by 2020, 2015
- Case Study for Lebanon: Mobility Cost, 2015
- Vehicles Fleet Renewal through a Scrapping Scheme in Lebanon, 2015
- Fossil Fuel Subsidies in Lebanon: Fiscal, Equity, Economic and Environmental Impacts, 2015
- Teachers' Guide on Climate Change, 2015

JULY 2016