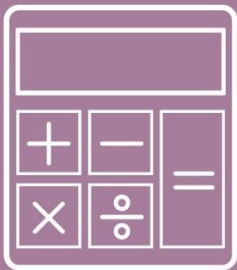




Support to Reforms – Environmental Governance (StREG) Programme

LAYMAN REPORT



December 2017



Support to Reforms – Environmental Governance (StREG) Programme

LAYMAN REPORT

December 2017

© 2017 Support to Reforms – Environmental Governance Programme

Disclaimer: This publication was produced with the support of the European Union. The contents of this publication are the sole responsibility of the authors and can in no way be taken to reflect the views of the European Union.

This publication was printed on recycled paper.

Printed at Librarie Madi.

Foreword by H.E. Mr. Tarek El Khatib, Minister of Environment

The Ministry of Environment (MoE) is a young ministry compared to others in Lebanon, it was only established in 1993, in the wake of the Rio Conference on sustainable development.

However, since its establishment, MoE has suffered from long awaited legal and institutional tools to give it the needed power to perform its mandate in safeguarding Lebanon's environment.

For instance, the law for the protection of the environment was only issued in 2002, nine years after the establishment of the Ministry. Additionally, some of the key application decrees such as the strategic environmental assessment decree, the environmental impact assessment decree, and the environmental compliance decree were only enacted in 2012. This was ten years after the law for environment set them as a basis for environmental management in the country.

Other indicators of weak environmental governance can be identified at the financial and institutional levels. In 2017, the MoE's budget was around LL14 billion (equivalent to around US\$9.3 million), and did not represent more than 0.04% of the planned budget for the Lebanese Government.

In addition to the challenges faced by the Ministry due to its financial gap, several other challenges are also hindering its functioning and can be reflected at two levels:

- The limited number of technical staff which does not reach 50% of the 118 technical staff called upon by the MoE's organisational decree.
- The limited resources which prevent the Ministry from conducting its fundamental activities including needed monitoring of the environmental situation in Lebanon in line with its mandate.

Against this challenging background, MoE has been collaborating with the European Union (EU) since its establishment, and has been reaching out to EU's expertise and experience to improve the environmental performance of the Lebanese public sector through reforming environmental governance. This is how the "Support to Reforms- Environmental Governance (StREG)" programme has set forth as its main objective to create effective capacity specifically at the Ministry of Environment to plan and execute environmental policy, including enforcement and mainstreaming by coordinating with key line-ministries.

Since 2014, this collaboration between the EU and MoE was launched and the EU has allowed the Ministry to strengthen its vision of seeking the right of the citizens to a clean environment. In light of the *legal, institutional, technical and financial* challenges facing the Ministry, several advances were brought forward through the StREG programme.

This report describes the achievements reached through the StREG programme at the level of its different components and describes the momentum which was created by the deployment of national and international experts in the implementation of the StREG programme and which allowed MoE as well as many other national institutions to be part of this learning experience.

We hope that this report will offer a window of opportunities for future achievements in strengthening environmental governance in Lebanon.

Foreword by Ambassador Christina Lassen, Head of the Delegation of the European Union to Lebanon

The European Union has long been involved in investing and encouraging activities that protect and improve the environment. In Lebanon, we have been active alongside the Lebanese government and with a number of NGOs and stakeholders to help protect, preserve and improve the environment for the country's present and future generations. We have financed projects that ensure a high level of environmental protection and preserve the quality of life of Lebanese citizens. Among these projects is the Support to Reform – Environmental Governance (StREG) programme.

Environmental governance allows us to examine the mechanism and processes behind the formulation and implementation of environmental policies and the EU's work in this regard is spread across a wide, often cross-cutting, range of issues.

Without setting and evaluating appropriate environmental policies, our present and future would be at stake. This is what the sustainable development action plan Agenda 21 set forth many years ago and this is what the Sustainable Development Goals are directing us towards nowadays.

From this perspective, the EU was readily available to support Lebanon and the Ministry of Environment in strengthening its environmental governance system out of the belief that without environmental governance, long-term and sustainable investments cannot be achieved.

In Lebanon, the cost of environmental degradation was estimated to be around US\$960 million in 2008, which is equivalent to 3.7% of the country's GDP. Lebanon is in much need of safeguarding its natural assets and the well-being of its citizens, and environmental governance constitutes an important step in that direction.

The StREG programme has managed to help the Ministry of Environment optimise its work and strengthen its mandate. From the administrative interventions such as automation and archiving, to establishing a scientific basis for policy making based on EU's best practice and experience, StREG has provided a platform for policy making in environmental management.

This report documents some of the achievements and lessons learned of four years of collaboration between the Ministry of Environment and the EU. It is not merely a document that looks at what has been done and the lessons that can be derived, it is also a basis for continued efforts to strengthen environmental policy in Lebanon and above all preserve the environmental resources of Lebanon for generations to come.

Environmental challenges know no boundaries. But solutions know no boundaries either. So let us work with the conviction that environmental cooperation goes a long way towards ensuring a better, cleaner and healthier life for our children and future generations.

About StREG

'Support to Reforms: Environmental Governance' or 'StREG', for shorthand, is a European Union-funded programme in the Ministry of Environment that aims to improve the environmental performance of the Lebanese public sector through reforms to environmental governance. StREG creates effective capacity at the Ministry to plan and execute environmental policy, enforce environmental law and mainstream environmental issues in key line ministries.

The StREG programme was approved by the Council of Ministers as per Decree 9189/2012 with a total budget of eight million Euro and a duration of six years. The technical assistance component of StREG was implemented over a period of 46 months, from March 2014 till December 2017, with a total budget of €4,689,060.

The five components of StREG are:

1. **Environmental Inspection and Enforcement:** preparing or updating procedures and laws to improve environmental standards, training inspectors and regulators to ensure effective enforcement in defined sectors.
2. **Administrative capacity of the Ministry of Environment:** strengthening the management information system and the functions within the Ministry such as archiving, inventory, operation and maintenance. The objective is to improve decision-making and accountability through accessibility and availability of key information.
3. **Environmental fiscal instruments:** developing priority fiscal instruments to promote and incentivise a shift from environmentally harmful activities to more sustainable alternatives.
4. **Environmental policy:** updating the National Environmental Action Plan (NEAP) and mainstreaming environmental policy and action in priority sectors in Lebanon, such as solid waste management.
5. **Communication:** strengthening the Ministry's outreach to key stakeholders and the public through different methods including publications, awareness-raising events externally and internally, and supporting a revision of the website.

Through these components, StREG supported the Ministry of Environment to fully and effectively implement its work programme at both national and regional levels. This in turn is crucial to safeguard Lebanon's natural wealth, resources and environment, forming the base for enhancing sustainable economic and social development in the country.

The StREG partners

The Ministry of Environment

The Ministry of Environment (MoE) is the national authority in charge of protecting the environment in Lebanon. The Ministry sets regulations and standards to protect the country's natural resources, provides clear guidance to support key actors to meet these environmental standards and executes programmes and projects to ensure sustainable development. More specifically, it is concerned with ecosystem conservation, air, water and soil pollution control and prevention, waste management, land management including quarries, chemical safety and an array of other environmental issues.

<http://www.moe.gov.lb/>

The Presidency of the Council of Ministers

The Presidency of the Council of Ministers (PCM) represented by the Project Administration Office (PAO) is acting as the Contracting Authority of the StREG Programme. As such the PAO supports the day to day coordination of activities as well as administrative, contractual and financial management of the programme. <http://www.pcm.gov.lb/>

The European Union Delegation in Lebanon

The European Union (EU) is represented in Lebanon by the EU Delegation, one of 139 EU Delegations around the world. Along with its Member States and the European Investment Bank, the EU currently executes a total budget of more than €2.2 billion of assistance to Lebanon, including approximately €1.3 billion of grants and €0.9 billion of loans.

The EU cooperation focuses mainly on promoting programmes that support political, economic and social reforms, local governance, refugees and mine clearance. Efforts to reform key sectors such as security, justice, social protection, support to civil society, education, energy, environment and agriculture are encouraged since they all support progression of sustainable growth and protection of fundamental rights, while reducing regional disparities in Lebanon.

https://eeas.europa.eu/delegations/lebanon_en

The StREG Execution Consortium

GFA Consulting Group GmbH (Germany)

GFA Consulting Group GFA has implemented complex studies and projects in over 130 countries since 1982. Leading development agencies, ministries and public clients have entrusted GFA with helping them to manage projects financed through bilateral and multilateral funds. Working in cooperation with stakeholders in government, the private sector, NGOs and citizens' groups, GFA balances innovation and reliability to meet local needs. <http://www.gfa-group.de/>

Umweltbundesamt

Umweltbundesamt (UBA) are Austria's largest expert organisation for all environmental issues. As an independent partner, UBA focuses on building bridges between the economy, science and politics at national and international level. With more than 500 experts in 55 disciplines, UBA are a leading provider of environmental solutions. <http://www.umweltbundesamt.at/>

Mott MacDonald

Mott MacDonald (MM) is a network of experts, active in 150 countries to support poverty alleviation, good governance, and to help increase access to basic services. MM build capacity and resilience in healthcare, education, water, and sanitation, and provide world-beating expertise in transportation, infrastructure, and renewable energy – while safeguarding the environment, promoting human rights and gender equity, and fostering social and economic development. <https://www.mottmac.com/>

Contents

List of Acronyms	3
1 Introduction	4
2 The Environment and Impacts of the Wars faced by Lebanon	5
2.1 <i>Historical Background</i>	5
2.2 <i>Environmental Impacts of the Syrian Conflict</i>	6
2.3 <i>Other Challenges in environmental Governance</i>	7
3 STREG's Approach	9
3.1 Component 1: Inspection and Enforcement	10
3.2 Component 2: Strengthening the Administrative Capacity of the Ministry	11
3.3 Component 3: Environmental Fiscal Instruments (EFIs)	11
3.4 Component 4: Environmental Policy	12
3.5 Component 5: Communication	12
4 Governance Pillars Strengthened	15
4.1 <i>Administrative Capacity of the Ministry Strengthened and Staff Trained</i>	15
4.2 <i>Robust and Applicable Laws, Regulations and Taxation</i>	18
4.3 <i>Towards a sustainable development planning process</i>	20
5 Key Environmental Threats Addressed	22
5.1 <i>Responding to the Environmental Impacts of the Syrian Conflict</i>	22
5.2 <i>Environmental Guide for Municipalities</i>	23
5.3 <i>Tackling Air Pollution</i>	24
5.4 <i>Enhancing Solid Waste Management</i>	27
5.5 <i>Fighting Land and Ecosystem Degradation</i>	28
6 Long Term Benefits and Outlook	32
7 List of StREG publications –	34

List of Figures

Figure 1: Oil Spill on Lebanese Coastline, resulting from 2006 July War	5
Figure 2: Hot spot map of the impacts of the additional solid waste generated due to the Syrian crisis on surface and ground water	6
Figure 3: Organisational Chart of MoE	9
Figure 4: The Five Components of StREG.....	10
Figure 5: Internal seminars held within Ministry of Environment to promote knowledge sharing between departments.....	13
Figure 6: Wildlife Protection Design, awarded by MoE through StREG	14
Figure 7: Participants during an interactive EIA training	16
Figure 8: Modalities for signaling of hazardous and infectious wastes on transportation vehicles as part of the related Ministerial Decision	19
Figure 9: Attendees and the panel at the launch of the Practical Guide for Municipalities to Enhance Environmental Management	23
Figure 10: A newly installed air quality monitoring station in Barouk, Mount Lebanon	24
Figure 11: Overview of the air quality monitoring network provided through StREG	26
Figure 12: Satellite image showing Prevalent Wind Directions and Potential Human Receptor Areas near Naameh Sanitary Landfill Site	27
Figure 13: Map of the boundaries and buffer zone of the Shouf Biosphere Reserve	29
Figure 14: Relationships between barriers to improved environmental management in the quarry sector in Lebanon.....	30
Figure 15: Tannourine Protected Area	32

List of Boxes

- Box 1: Summary of the guiding Principles of the law 444 of 2002 on Environmental Protection
- Box 2: A Summary of the NSDS Initial Pillars

LIST OF ACRONYMS

EIA	Environmental Impact Assessment
EFIs	Environmental Fiscal Instruments
EMP	Environmental Management Plan
EPR	Extended Producer Responsibility
EU	European Union
EUD	European Union Delegation
GDP	Gross Domestic Product
HCW	Health-care Waste
HW	Hazardous Waste
ICT	Information and Communication Technology
IRI	Industrial Research Institute
IWG	Inter-ministerial Working Group
LCRP	Lebanon Crisis Response Plan
MoE	Ministry of Environment
NEAP	National Environmental Action Plan
NSDS	National Sustainable Development Strategy
PCM	Presidency of the Council of Ministers
SBR	Shouf Cedar Biosphere Reserve
SoER	State of Environment Report
StREG	Support to Reforms – Environmental Governance
SWM	Solid Waste Management
UNDP	United Nations Development Programme
WHO	World Health Organization

1 INTRODUCTION

This publication encapsulates and details the progress made in the past four years of cooperation (2014 – 2017), between the Ministry of Environment and the European Union, through the ‘Support to Reforms – Environmental Governance’ programme (StREG).

MoE was established in 1993 in response to strong political will and the clear gap in environmental governance, which was evident in the degradation of Lebanon’s natural wealth. The impacts have been felt in air quality, freshwater and marine resources, biodiversity, forests and other ecosystems, leading to uncontrolled land degradation and severe health risks from pollution. From its birth to the present day, the MoE has set environmental priorities through different work programmes and it was supported in the delivery of these strategic objectives, through technical assistance from international funding.

With a budget of eight million Euros, StREG represents the most significant direct support by the EU to the Ministry of Environment in Lebanon. StREG fits into the context of the EU’s broader bilateral cooperation and assistance with Lebanon which is based on the Lebanon Association Agreement from 2002, and which materialised into specific objectives in the EU-Lebanon Action Plan 2007.

The intention of this report is to provide the reader with a clear and digestible overview of the objectives of the programme and its achievements. The publication communicates the role played by StREG, and its key partners, as part of sustained effort by the Government of Lebanon to strengthen environmental governance in order to protect and manage its threatened natural environment. In this context, the contribution of StREG to MoE’s long-term vision for environmental reform in Lebanon is presented here as a useful and accessible tool for policy analysts, researchers, decision-makers and also for the wider public.

This publication therefore documents the continued and lasting impact of the programme by offering all stakeholders, both present and future, a good understanding of its outputs and creating the space and opportunity to build on the work of StREG. This legacy is seen as a fundamental expectation arising from the efforts of StREG and all its partners.

2 THE ENVIRONMENT & IMPACTS OF THE WARS FACED BY LEBANON

2.1 Historical Background

Lebanon's civil war, which raged from 1975 to 1990, placed much of the country's natural resources under severe stress, with a weak application of environmental governance during this period.

The first attempt to protect and regulate the environment came in 1981 with the formation of the State Ministry for Environmental Affairs, which was not continually operational in the period until the Ministry of Environment was established in 1993. Effective governance, however, remained dim in the face of intensive and uncontrolled post-war reconstruction that further degraded Lebanon's natural wealth. Air quality, fresh water, coastal and marine resources, mountains and forests, all suffered. The extraction of sand and rocks were mostly unregulated and the internal displacement of people created intense pressure on coastal and urban areas. Additionally, the sudden return of the Lebanese who fled the war saw an increase in sea and fresh water as well as pollution from traffic congestion and industry.

The 2006 July War on Lebanon was particularly damaging to protected areas, forests, agricultural land and the coastline. The bombing of a coastal power plant at the time resulted in an oil spill that significantly affected coastal and marine wildlife and the valuable ecosystems supporting them. During that year, the international community was mobilised to support Lebanon in clean up and restoration efforts. According to the State of Environment Report (SoER) of 2010, post-war international funding for the environment reached an estimated \$50 million¹. This crucial funding came from various sources including the EU, bilateral donors, as well as United Nations agencies.



Figure 1: Oil Spill on Lebanese Coastline, resulting from 2006 July War

Source: <https://ejatlas.org/conflict/jieh-power-plant-oil-spill-lebanon>

¹ MOE/UNDP/ECODIT, 2011. *State and Trends of the Lebanese Environment*. Available at: http://www.undp.org.lb/communication/publications/downloads/SOER_en.pdf

2.2 Environmental Impacts of the Syrian Conflict

More recently, Lebanon's environment has also been affected by the ongoing war in Syria. The conflict in Syria which started in 2011 displaced over seven million people internally and drove more than 5 million out of their country².

According to the Lebanon Crisis Response Plan for 2017-2020, Lebanon hosts around 1.8 million people (around 1.5 million from Syria and around 300,000 Palestinians). This is nearly equal to 40% of the Lebanese population.³

In 2014, with the support of StREG, MoE published an assessment of the impacts of the Syrian war on Lebanon's resources and the prioritised interventions. The Environmental Assessment of the Syrian Conflict of 2014 and its update in 2015 (refer to List of StREG Publications) identified several impacts of the Syrian crisis on the environment in Lebanon.

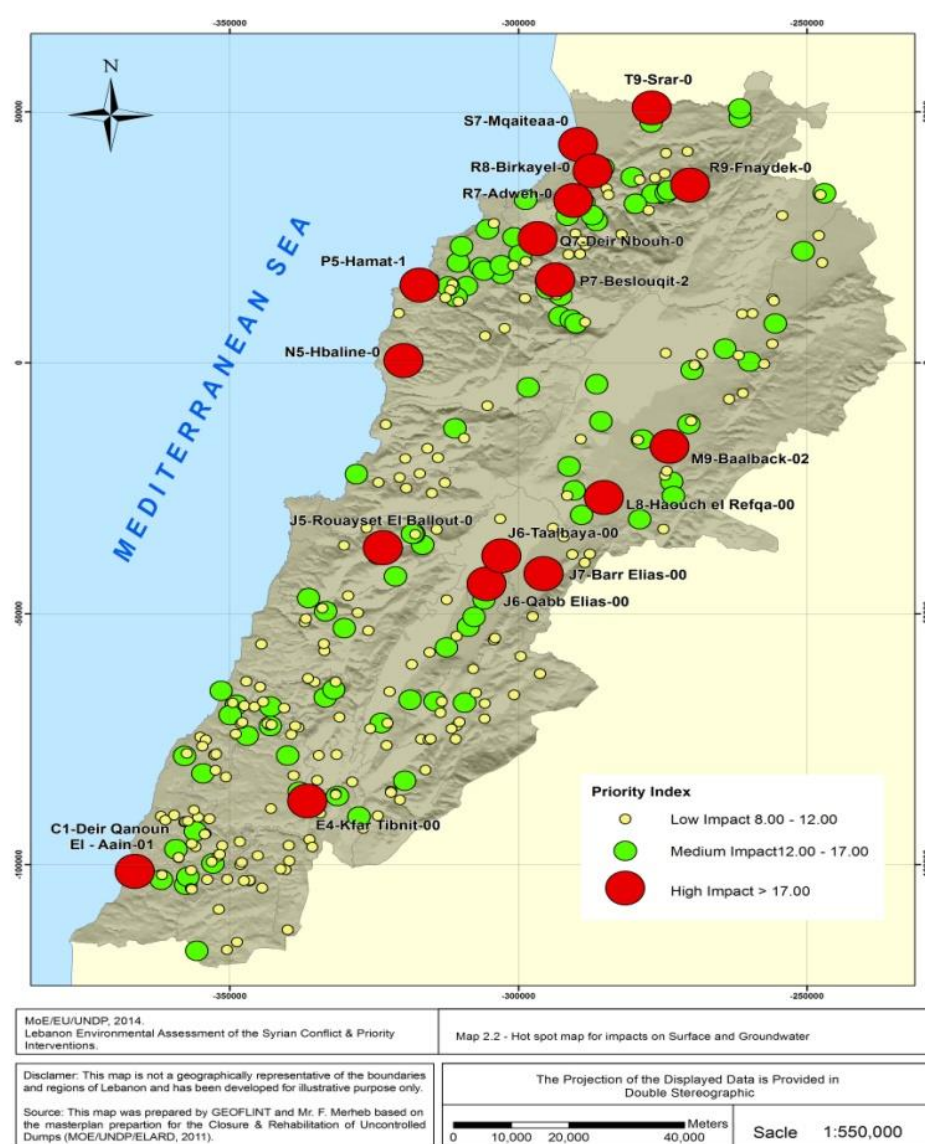


Figure 2: Hot spot map of the impacts of the additional solid waste generated due to the Syrian crisis on surface and ground water

Source: Environmental Assessment of the Syrian Conflict, 2014 (refer to List of StREG Publications)

² United Nations High Commissioner for Refugees: <http://data.unhcr.org/syrianrefugees/regional.php>

³ Lebanon Crisis Response Plan 2017 – 2020 <https://data2.unhcr.org/en/documents/details/53058>

Contamination of soil, land and air from increased solid waste. The sudden swelling of population compromised health and safety, and added pressure on waste management. More open dumps attracted insects and rodents and elevated the risk of disease. The piling up of waste and its burning is further contaminating the soil and polluting the air. With around 15% increase in solid waste generation, an additional amount of 324,000 tonne/year required collecting, sorting and disposal. It was estimated that municipalities spent 40% more money on waste management between 2012 and 2013.

Water is exhausted, polluted and carrying higher risk of disease. The demand for water increased by 12% and wastewater grew by 14%, adding pressure on and depleting groundwater resources. In the absence of proper wastewater management, this overflow of wastewater and its organic content is disrupting the natural balance of land, water and soil. This is mainly observed in the Cazas of Baalbek, Akkar, Zahleh and Baabda. This situation is aggravated as it has been estimated that only 8% of Lebanon's wastewater was treated; the rest is discharged in watercourses and open lands leading to dangerous health impacts.

Air quality deteriorated. The stark and sudden surge in population size increased traffic, demand for heating, energy for electricity and open burning of waste dumps. This resulted in toxic and carcinogenic combustion fumes and 20% growth in air pollutants.

Degradation of Land and Ecosystems. The assessment shows that vulnerable and poor communities are the main hosts of the displaced. In some cases, the latter are equal or larger than the local population. This exponential increase in the population is leading to accelerated and haphazard construction.

An update of the assessment in 2015 (refer to List of StREG publications), by StREG and MoE, revealed that the main impacts of the Syrian crisis continue to be aggravated at the level of the land use and ecosystems, while the situation remained the same in other sectors. MoE based its conclusions on a mapping of the "Most Vulnerable Cadastres" conducted by the UN in 2015, which showed that poor and vulnerable communities most affected by the Syrian crisis are concentrated in agricultural lands and coastal areas, which are already fragile and threatened by development in the country.⁴

2.3 Other Challenges in environmental Governance

The young MoE, which was established in 1993 with only three staff, faced overwhelming challenges to deliver effective environmental governance in Lebanon.

Staff

Since 1993, recognition of the need for increased spending on the environment has seen the number of staff grow to 90, however, this is still considered less than half of the initially planned 215 staff members. Decree 2275 issued in 2009 stipulates that 215 staff in MoE are needed to deliver adequate environmental governance. Recruitment and retention of qualified and experienced individuals has been challenging, primarily due to low salary levels in the public sector coupled with competition from the private sector. Notably, the MoE is supported with its work force through support from EU, World Bank, United Nations agencies and other bilateral donors.

Budget and Procurement

MoE functions on a very meagre budget. It started in 1993 with a budget of \$0.9 million, which grew to \$4.88 million in 2010. Currently the budget amounts to \$9.3 million per year. This budget remains insufficient to meet the demands of environmental governance in Lebanon. This is compounded by lengthy and complicated procurement procedures. Additionally, in many cases, purchases or processing of public funding requires approval from the Council of Ministers, which sometimes delays execution of projects and procurement of equipment for over a year. Meanwhile, the environment suffers and degradation amplifies.

⁴ United Nations Development Programme "Most Vulnerable Cadastres in Lebanon", July 2015
https://reliefweb.int/sites/reliefweb.int/files/resources/convergence_July_2015.pdf

Evidence base and statistics

As a direct consequence of staff and budget shortage, MoE is facing a dearth in evidence and statistics. Given the fact that environmental information and statistics are not being collected and stored consistently, decision-making and enforcement of environmental policies and legislation are impaired.

Legislation

The overarching legal instrument for environmental protection and management in Lebanon is law 444 of 2002 on Environmental Protection, guided by eleven principles summarised in Box.1 below.

Box 1: Summary of the guiding Principles of the law 444 of 2002 on Environmental Protection

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 mores and customs in rural areas;
9. Environmental monitoring (pollution sources and pollution abatement systems);
10. Economic incentives to encourage compliance and pollution control;

Law 444 is translated into more than 20 decrees, some of which are facing tremendous delays to enact due to falling into the entanglements of political debate. To give an example, the first draft of the Environmental Impact Assessment decree was prepared more than a decade before it passed in 2012. Despite the delays in passing the decree, MoE has managed to apply the EIA in many sectors through the permitting processes of other ministries such as the Ministry of Industry, and the Ministry of Public Works and Transport. This is a testimony to the Ministry's resilience and capacity to function despite a number of overwhelming challenges.

The MoE is continuously pursuing the development of the legal framework leading to establishing sustainable funding mechanisms, such as the National Environmental Fund, to manage and protect the valuable resources of this small Mediterranean country.

3 STREG'S APPROACH

The SoER of 2010 and the Draft National Environment Action Plan (NEAP) developed in 2005 constituted an important basis for StREG's focus and direction. The SoER described in detail the main financial, technical and institutional hurdles that Lebanon faced, and continues to face, in achieving effective environmental governance. This provided a clear path for StREG to target solutions for technical (e.g. air quality and solid waste management) and procedural (e.g. Environmental Impact Assessments and enforcement) elements of governance. Based at the Ministry of Environment, StREG established an open channel of communication and coordination with the staff in order to create ownership for the outputs delivered by the project.

As such, StREG collaborated with all 90 staff of the Ministry of Environment who are working across seven different services of the Ministry as presented in the organisational chart below.

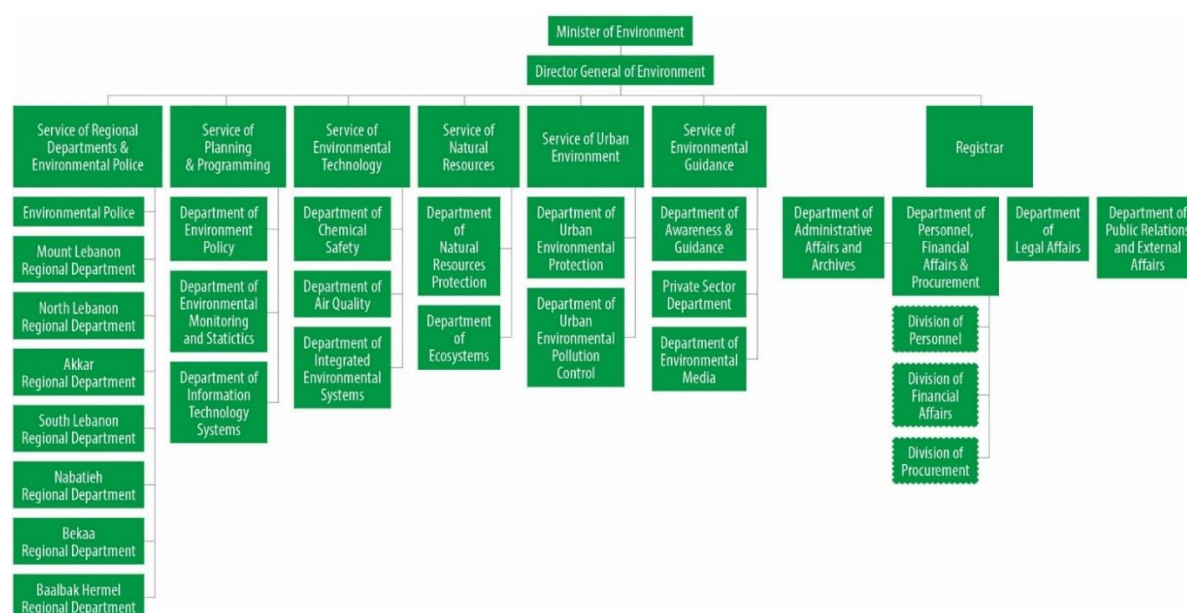


Figure 3: Organisational Chart of MoE⁵

StREG focused on enhancing the weak pillars of environmental governance. It did so by tackling the deficiencies in procedures, capacity and policies preventing MoE from growing the teeth to force compliance in different sectors and ultimately deal with the key threats to Lebanon's environment. In this line, StREG also provided direct support in mitigating these environmental problems.

In order to achieve this, the project was divided into five components, each of which was assigned and driven by a senior key expert. Through this interdependent structure, StREG took on a holistic approach in targeting the overall performance of the Ministry rather than at an individual level.

⁵ Source: MoE/UNDP, 2016. *MoE/UNDP Partnership: Key Achievements from 2010-2015*



Figure 4: The Five Components of StREG
Source: StREG resources

3.1 Component 1: Inspection and Enforcement

This component addressed gaps in legislative, budgetary and staff capacity related to procedural (e.g. inspection and enforcement training) and technical matters (e.g. legal delineation of protected areas). Experts were brought on board to review and benchmark the existing legal framework and assess the shortfalls in the enforcement of the law. Additionally, this component involved developing guidelines and road maps to facilitate the longer-term implementation of the proposed changes.

This component also ensured collaboration with other sectors given that the management of natural resources cuts across many sectors and falls under the responsibility of a range of governmental bodies. Alongside MoE, the ministries in charge of water and energy, industry, urban planning, health and agriculture also execute functions which can affect environmental permitting, inspection and enforcement. The Ministry of Finance, the Council for Development and Reconstruction, the Ministry of Interior and Municipalities and the Ministry of Justice equally play important roles in environmental governance especially in finance and budget matters as well as coordination, investment and prosecution of offenses.

To address coordination gaps and ensure collaboration, StREG established an Inter-ministerial Working Group (IWG) with representatives from the different Ministries to guide and oversee the work under this component. The group, which comprised the Ministries of Environment, Justice, Interior and Municipalities, Industry, Energy and Water and Finance, met on several occasions and provided initial review of inspection and enforcement practices. Focus was naturally drawn on areas of overlapping control and the potential for a more efficient response to areas of shared governance. This joint, cross-sector approach formed the basis for drafting new inclusive procedures in different sectors and provided the necessary training to implement them.

In this component, the StREG team, with the support of the MoE, focused on improvements in the following core areas: industry and combustion, storage of material to avoid accidents and resulting pollution, clinical/hospital waste transport and customs, quarrying, and protected areas.

3.2 Component 2: Strengthening the Administrative Capacity of the Ministry

In this component, StREG focused on improving the management capabilities of MoE in light of inefficiencies in key administrative processes. After a thorough needs analysis, the project sought to modernise the Ministry's operational efficiency. It became clear that full automation of the MoE offices supported by a substantial upgrade of the Information and Communication Technology (ICT) equipment was the way forward to achieve this. This component hence became the main vehicle for the EU and StREG to address budgetary restrictions and overcome procurement difficulties affecting the Ministry and its performance in environmental governance.

This component provided equipment at both the Ministry and national level. It established the necessary ICT infrastructure to automate MoE including internet access and data storage, electronic tablets, computers, printers, etc.. It also installed air quality monitoring and weather stations to address major substantive issues of air pollution and forest fires challenges in Lebanon.

The automated system will ultimately enhance the speed of the Ministry to manipulate crucial data and information and hence its responsiveness and ability to meet the growing needs of the Lebanese citizens. Focus on modernization also involved the development and implementation of a state of the art archiving and record management system.

This component brought support to the Ministry and its staff through training activities, as well as improving the MoE's archiving system. In this context, StREG implemented an extensive training programme on the Environmental Impact Assessment and its overall processes, which benefitted around half of the technical staff of the MoE.

3.3 Component 3: Environnemental Fiscal Instruments (EFIs)

This component focused on knowledge transfer and development of legislation related to EFIs.

Drawing on the polluter pays principle of law 444/2002, this component operated through analysing specific fiscal instruments to regulate the use of environmental resources. EFIs aim to create financial incentives and penalties that change the behaviour of the polluter. In this context, StREG investigated the potential use of EFIs in the cement/quarry sector and in the solid waste recycling sector. This method contrasts with the classic "command and control" system of governance, which relies on clear laws and regulations to be followed but in some cases lack the enforcement measures to be effective. This component focused on Article 20 of law 444/2002 as it pertains specifically to the use of fiscal instruments and provision of subsidies for activities that benefit the environment.

This component also adopted a technical working group to ensure a participatory and integrated approach that linked the studied EFIs to reality, and translated them into practice.

StREG's technical team identified suitable EFIs for Lebanon by analysing the tools and best practices used in other countries and researching the key environmental impacts in Lebanon in light of the existing laws and tax policies. Key individuals in government active in the finance, agriculture, industry, energy, water, forests, protected areas, climate change, urban affairs, and transportation sectors were consulted.

3.4 Component 4: Environmental Policy

Under this component, StREG adopted two different but complementary approaches:

- At a national level, StREG followed up on key policy documents such as the Draft National Environmental Action Plan (NEAP) in order to mainstream environmental management in the country-wide sustainable development process underway in Lebanon.
- At sectoral level, StREG promoted policy dialogue and provided needed capacity development and innovative methodologies to mainstream key environmental issues in priority sectors, such as air quality, solid waste, water and waste water and land use, at central and local levels.

In line with the objective to support the Ministry to effect change and establish greater input and control in different spheres, this component invested much effort into promoting policy dialogue on environmental priorities and actions with concerned government institutions, local authorities, civil society and private sector. The approach consisted of establishing formal consultative groups, such as the "Air Quality Task Force" for the adoption of the "Air Quality Management Strategy". Moreover, several consultation meetings were conducted for ensuring the alignment of the proposed policies and plans with concerned national stakeholders. This approach was adopted in the process of developing all assessments and plans, such as the "Guide for Municipalities to Enhance Environmental Management".

This component additionally focused on building and collecting vital data that formed the basis of crucial environmental governance. Notably, studies were undertaken at cross-sectoral level covering sustainable development and the impact of the Syrian conflict as well as at sectoral level covering several priority environmental aspects such as air quality and solid waste management in Lebanon.

3.5 Component 5: Communication

This component was added half way through the project to strengthen the connection and communication between the Ministry and the general public and other stakeholders. To accomplish this, the adopted approach involved developing a strategy and products to communicate the results of the project and key accomplishments to enhance their reach and effectiveness.

To enhance communication, StREG set out to produce leaflets and reports targeting the public and other stakeholders as well as events to launch StREG's national contributions. To ensure public access to StREG's products and deliverables, the project established its own website and upgraded the Ministry's website.



Figure 5: Internal seminars held within Ministry of Environment to promote knowledge sharing between departments

Source: StREG resources

This component also sought to socialise information and improve coordination and knowledge transfer internally within MoE. This was accomplished primarily through a number of themed brown bag presentations, which were regular events that gathered the Ministry's staff around pertinent and contemporary topics.

The StREG project sought different and innovative methods to create awareness and support the MoE's mandate and public image. One such example came in the form of the Ministry's Protection of Wildlife and Sustainable Hunting campaign. StREG created a poster design competition and award, encouraging students and young designers to submit a combined message and image for the campaign. The competition was extremely successful, receiving a total of 11 entries from both individuals and teams, and stirring up media attention. The winning design, which received the first prize, was displayed on billboards throughout Beirut in 63 fixed key locations for a full month.



First prize: Nancy Kalach



Second prize: Lea Oueidat



Third prize: Omar Mougharbel

Figure 6: Wildlife Protection Design, awarded by MoE through StREG

4 GOVERNANCE PILLARS STRENGTHENED

After careful diagnosis and investment of skilled effort, StREG identified and responded to root causes of the weak environmental governance in Lebanon. The project focused on the foundations of governance to ensure long-term positive impacts and durable results.

StREG addressed deficiencies in staff capacity with training and knowledge transfer and responded to inefficiencies in administrative processes through state of the art equipment, an upgraded management system, and automation. To strengthen compliance, nurture a culture of responsibility towards the environment and fill gaps in well-defined procedures, StREG created a complete framework of robust and applicable laws, regulations and taxation. It also developed data, quality environmental standards and emissions limits to strengthen monitoring and curb degradation.

4.1 Administrative Capacity of the Ministry Strengthened and Staff Trained

Beyond filling gaps in knowledge and technical know-how, the training provided by StREG treated structural weaknesses. It reinforced common language, understanding and cooperation between staff.

StREG analysed the situation of regional departments in terms of staffing, qualifications, job descriptions and recommended actions to enhance governance in the newly established offices (refer to List of StREG Publications). In addition, it was the driver for trainings and capacity development seminars. After completing a thorough assessment of training needs, the project designed courses to boost the Ministry's quality management and leadership (refer to List of StREG Publications). Although these courses were not eventually delivered, it is useful to note that they included strategic planning, time management, conflict resolution and management, and effectiveness of communication skills.

The main boost to technical expertise came through focusing training efforts on Environmental Impact Assessments (EIAs) and legal enforcement. Training was conducted with a focus on building practical knowledge on EIAs and improve inspection and enforcement, across all MoE departments.

Environmental Impact Assessment (EIA) Training

StREG organised a series of EIA trainings for a total of 40 MoE staff directly involved in the process, which is almost half of the technical staff at the MoE. The EIA training introduced good practices and experience from EU countries, using mainly Austrian examples to allow Ministry staff to have a bird's eye view of a long-lived process and learn how to circumvent the main difficulties (refer to List of StREG Publications).

"The training was an opportunity to get familiarised with each other more and learn about a very evolved EIA system, which Austria's is."

– Anna Shadarevian, Head of Department of Private Sector, MoE

Environmental Impact Assessment is the main procedure for taking into account the environmental implications of a project before approving it. Typically, EIAs include an Environmental Management Plan (EMP) that informs authorities and the public about which measures are being taken to prevent harm to the environment, for example on managing the emerging solid waste, wastewater or air emissions. The EMP allows the Ministry to monitor the project and actions taken to mitigate environmental impacts.



Figure 7: Participants during an interactive EIA training
Source: StREG resources

After an owner of a quarry, cement factory, poultry farm, dam, incinerator etc. submits an EIA, the study passes through the Ministry's experts who provide an opinion on the project. Part and parcel of the procedure is a public consultation process whereby the citizens that are likely to be impacted by the project are engaged through meetings organised by the owner of the project.

Despite important efforts to advance environmental permitting, the MoE only started to engage systematically with the EIA process after the application decree was passed in 2012. The process is therefore very young and the experience of all involved institutions including the Ministry staff in the EIA cycle is still in its early beginnings. The limitations in knowledge and experience are leading to significant delays in producing decisions on EIAs. The needs for learning in this area are huge and StREG provided the perfect opportunity to start closing this gap.

The EIA training covered the full EIA cycle covering the development, monitoring, inspection and enforcement of the conditions set out in the EMP. The training targeted all the MoE staff involved in the EIA processes including the EMP monitoring and it boosted their ability to ensure that adequate action is taken to mitigate environmental impacts.

Improving the Ministry's administrative processes

The Ministry's administrative processes still rely on a manual filing and correspondence system and functioned on an obsolete Information and Communication Technology (ICT) infrastructure. Added to a limited number of staff and a small budget, this greatly slowed down work processes, negatively affected performance and the public perception of MoE and ultimately impacted its ability to carry out its mandate to protect against degradation of Lebanon's environment.

The Ministry receives and sends out correspondence from/to other ministries, citizens, civil society and other stakeholders through the registrar. This correspondence consists of requests, letters, and EIA studies. It also receives citizen complaints on a broad range of issues, which often relate to uncontrolled and dangerous pollution. All these are handled manually, which sometimes results in loss of files or in delays that cannot be traced because the dossiers physically travel through different departments without the possibility of being tracked. EIA studies are one example of an area gravely affected by such delays, whereby project owners who submitted EIAs are compelled to constantly enquire about the status of their applications.

StREG enhanced the efficiency of the current human and financial resources available at MoE by upgrading ICT equipment and software, and automating the system. It consisted of substantive infrastructure that the StREG made possible with the generous contribution of the European Union.

StREG supplied the Ministry with 50 computers and monitors, 10 lap-top computers, 10 tablets, 17 printers, 1 large format scanner and 1 plotter, 3 GIS work stations with 27 monitors, 10 GPS units for GIS data collection, satellite data for GIS applications, 1 projector and screen, software, and a camera surveillance system to enhance security at the Ministry.

"This ICT infrastructure was badly needed, it relieved the Ministry from an important financial burden and improved performance significantly, I would say 70% of the work improved because of this upgrade."

- Nadia Ahmar, Head of Service of Planning & Programming, MoE

As a major tool for administrative reform, StREG particularly focused on automation. StREG provided the necessary tools and know-how to electronically store and manage all incoming and outgoing administrative transactions. Although it has yet to be put into action, the fully designed automation system will allow all Ministry staff from top to bottom to effectively and efficiently complete and track administrative affairs and enhance the transparency of transactions. Through automation, files are stored and archived securely while mirroring the physical archiving system. This automation system and implementing manuals will speed up all transactions and allow tracking to identify and manage bottlenecks (refer to List of StREG publications). Most importantly, automation will allow the Ministry to provide quality service to citizens by saving them follow-up time and efforts.

This will improve efficiency and positively impact MoE's interface with other institutions, civil society and the public as well as advance internal processes in Human Resources.

StREG also developed a leave management system that curtails the time needed to obtain approval and registers the different types of leave with accurate information on the remaining balance for every employee. Before automation, employees' leave requests bounced from one department to another. By the time they reached the minister's office for final approval, the leave period was surpassed.

"The automation of the management of key data and records is an important step for the modernisation of MoE and other public institutions in order to reach good governance. The tools set up by StREG to initiate this automation are a starting point for MoE to become more efficient in its operations".

- Nancy Khoury, Acting Head of Service of Registrar, MoE

The Ministry's Archives and Library

Scarcity of time and shortage of staff condemned valuable documents and archives for more than ten years, to a life in boxes in a deserted room at the Ministry.

StREG's support completely remedied the situation and transformed the room into a resourceful archives centre. With the project's support, new rooms were opened and shelves constructed to store all the documents of the registrar and other specific departments. The documents were organised and archived according to year and subject matter, which importantly included all previous environmental studies (EIAs, Initial Environmental Evaluations, etc.).

StREG also filtered books and publications and modernised the library for the Ministry, adorned with a computer corner and a work station. The library was divided into resourceful sections providing publications on forest fires, global warming, ozone, etc. useful for people of all ages especially researchers and students. On another level, the project developed templates to create digital databases, paving the way for an improved information database.

4.2 Robust and Applicable Laws, Regulations and Taxation

StREG presented an opportunity to bring powerful solutions to the complexities plaguing law and policy-making in Lebanon. This process had notably suffered from the lack of a clearly defined and consistent approach and limited staff capacity. Some laws and decrees require updating in line with latest developments, such as in the case of the Hazardous Waste decree. In many other cases, laws and decrees face colossal hurdles to be prepared and limited staff time and capacity means that they are often shelved for years before they can be processed.

StREG has provided key legislative improvements, to advance governance through a mix of strengthened enforcement procedures and financial incentives. Additionally and decisively, StREG has provided the platform and link between the technical inputs, drafting and legal review between all the relevant actors.

Environmental Fiscal Instruments

StREG pioneered this field in Lebanon. The *Application Decree 167 of 2017 pursuant to Article 20 of Law 444 on Environment, on "support for activities that benefit the environment" adopted by the Government of Lebanon in early 2017* is the result of the work in Component 3 of StREG on EFIs. It is the first time such a tool has been introduced to environmental governance in Lebanon. This decree allows subsidies for actions that benefit the environment and thus indirectly addresses the lack of funding in the sector.

"This tool sets a precedent for a modern way of financing the environmental sector. It forever acknowledges the sector in society as a whole."

– Constanze Schaaff, Project Director, StREG

StREG also researched and looked into the potential use of EFIs in the quarries and solid waste management sectors to encourage more environment-friendly practices through financial incentives (refer to List of StREG Publications). The studies used existing data to infer the potential and effectiveness of using taxes and subsidies to modify the citizens' behaviour. For quarries, one proposed measure was to increase the price of the extracted products through a landfill tax, which would make it costly to dispose of demolition and construction waste. Other measures included incentivising the recycling process of the waste, creating more robust financial guarantees for rehabilitation and prosecuting operators who abandon the quarries.

For Solid Waste Management (SWM), the study recommends further strengthening the database in the SWM sector and looking into the feasibility of introducing incentives for increasing recycling and raising revenues for SWM. The report further recommends setting up an Extended Producer Responsibility (EPR) system to make the importer, producer and/or wholesaler responsible for properly collecting and disposing of end-of-life materials or facilitating the recycling of this waste.

Establishment of the Environmental Police

So far, law enforcement pertaining to environmental violations and pollution has been carried out by either the municipal police (minor cases and infractions) or the internal security forces, who are poorly equipped and untrained in penalising environmental cases.

Among the most prominent work done by StREG in 2016, it is worth noting the support provided for the development of the application decree 3989/2016, on the establishment of the environmental police, determining the number of its members and organising its work. StREG has therefore supported the future

recruitment of a 40-strong specialised environmental police force, who will work under the responsibility of the Ministry of Environment and the general prosecutors' offices.

The police force is expected to significantly help curb environmental crimes and execute legal rulings. In addition, the MoE and its regional departments were adequately equipped with digital cameras, GPS and noise metres to carry out their functions.

"If the law enforcement officer is not trained in environmental infractions, he or she would not even know what to write on the ticket he/she is issuing to the violator. MoE's mission is to protect flora and fauna. To do our job right, we need specialised, independent (impartial) and trained people in the judiciary system from the prosecutor down to the officer."

- Samar Malek, Head of Service of Environmental Technology, MoE

Health Care Waste (HCW)

In the context of waste management, StREG drew focus on the lack of clear rules governing Health Care Waste, arising from hospitals and posing real risk to health. The StREG legal team and technical experts reviewed the existing legal texts and updated needed procedures for this sector, through the following ministerial Decisions.

➤ *Environmental conditions and permitting of the Health Care Waste (HCW) treatment facilities*

The purpose of this ministerial decision is to regulate the operation of infectious Health Care waste treatment facilities through establishing environmental guidelines and setting the conditions for granting environmental permits for the operation of these facilities. The Decision specifies the procedures and requirements for permit applications, as well as the technical specifications, documentation and environmental guidelines that should be followed in the operation of treatment processes, and in the management of their inputs and outputs.

➤ *Environmental conditions for the transport of Health Care Waste*

The purpose of this ministerial decision is to regulate the transport of infectious healthcare waste through establishing environmental guidelines. The decision covers the specifications of vehicles and general responsibilities which the transporter should abide by to avert undue harm to public health and the environment during the transportation process.

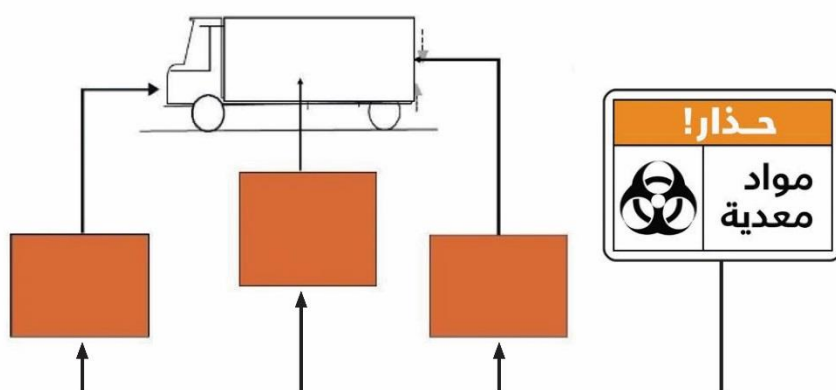


Figure 8: Modalities for signaling of hazardous and infectious wastes on transportation vehicles as part of the related Ministerial Decision

Source: HCW Decision on environmental conditions for the transport of HCW (refer to List of StREG Publications)

The Hazardous Waste (HW) Decree

Similarly to Health Care Waste, Hazardous Waste requires close attention and solutions to its use and disposal. This defined the management and classification of Hazardous Waste and sought to provide detail to the monitoring, auditing, registration, storage, treatment and disposal of hazardous waste. The existing draft decree and two related ministerial decisions were revised and updated by StREG in view of their issuance for approval by the Lebanese Government.

Emission Standards

Emission Standards are fundamental to building a strong governance framework as they set quantitative limits on the permissible amounts of pollutants and are important for environmental health within Lebanon. StREG focused on updating the MoE decisions related to Emission Limit Values, which date from 1996 and 2001 and allowed the development of Emission Standards for Lebanon in line with the latest international practice. This progress will allow the specific amount of pollutants spewing from industry into the air and water across the country to be determined in concrete terms. Without a thorough assessment based on objective and scientific standards, inspection and enforcement processes will remain weak. This step of placing these standards in law crucially asserts the mandate of the MoE, dragging power back and ultimately providing the basis for enforcing behavioral change in the country.

It is also notable that the StREG's legal team has been able to support across a wide range of sectors, some of which will be further touched on in this report. These include the delineation of protected areas, well drilling in buffer zones of protected areas, strengthening the enforcement tools of the law on quarries, wastewater and sludge reuse, and compost and petroleum coke regulation.

4.3 Towards a Sustainable Development Planning Process

StREG's policy interventions established solid pillars for sustainable environmental governance in Lebanon especially by engaging with key local, national and international players.

Towards a National Sustainable Development Strategy (NSDS)

The Ministry of Environment prepared the National Environment Action Plan (NEAP) in 2005-2006 to define Lebanon's environmental priorities and key entry points to mitigate environmental pollution and degradation. The draft NEAP set a plan to work with other ministries and institutions on ten themes including strengthening environmental enforcement and inspection, climate change adaptation, managing air pollution, conserving ecosystems and promoting hazardous and non-hazardous waste management.

StREG built upon the draft NEAP in order to merge it within Lebanon's initiative for establishing a sustainable development plan under the leadership of the Presidency of the Council of Ministers (PCM). This initiative resulted in the launching of the process for the development of the NSDS, an overarching and holistic vision and strategy for Lebanon's socio-economic as well as environmental agenda.

StREG engaged a plethora of experts to draft the background document of the strategy that would support Lebanon in achieving a progressive and holistic long-term vision, which pursues a healthy and prosperous future for all its citizens.

BOX 2: A Summary of the NSDS Initial Pillars⁶

1. Enhancing human Capital
2. Strengthening social cohesion
3. Ensuring the efficient provision of services
4. Fostering green economic growth
5. Preserving the natural and cultural heritage
6. Instilling good governance
7. Asserting Lebanon's position as an Arab, Mediterranean and international hub

The NSDS process was closely linked to the Sustainable Development Goals (SDGs) and covered global issues including the development of a new low-carbon economic model and poverty reduction. The background documents and database developed as a part of the NSDS process with the support of StREG have been integrated in the on-going national planning efforts in Lebanon such as the SDGs' gap assessment initiated by the Lebanese Government in 2017 (refer to List of StREG Publications).

⁶ [http://nsds.pcm.gov.lb/Cultures/ar-LB/publications/docs/Documents/Strategic Objectives Initiatives.pdf](http://nsds.pcm.gov.lb/Cultures/ar-LB/publications/docs/Documents/Strategic%20Objectives%20Initiatives.pdf)

5 KEY ENVIRONMENTAL THREATS ADDRESSED

StREG enhanced the capacity of MoE by providing the tools and methods, laws and policies from which good environmental governance could take root and grow. To complement this groundwork, StREG contributed through direct technical assistance, which focused on tackling the most pressing causes of environmental degradation.

StREG succeeded to integrate environmental concerns within the national response to the impact of the Syrian conflict. StREG also provided needed technical assistance for addressing environmental priorities such as solid waste management across the country.

Additionally, StREG's experts supported the Ministry with the necessary tools in its fight against land and ecosystem degradation and subsidised critical equipment to support an effective national response to growing air pollution. StREG created a network of air quality monitoring stations and meteorological stations, which formed a decisive step in the long-term struggle against the degradation of human and ecological health of Lebanon.

5.1 Responding to the Environmental Impacts of the Syrian Conflict

In 2014, with the support of StREG, MoE published the key and only assessment of the impact of the Syrian war on Lebanon's environment and natural resources and set prioritised interventions to respond the ensuing degradation. This was an important milestone for the ministry. Despite the fact that the sudden rise in Lebanon's population (equivalent to approximately 40% of the existing population) caused by the displacement from the Syrian war has had profound environmental implications, this was not taken into account in national response strategies. The Environmental Assessment of the Syrian Conflict, which was updated in 2015, provided clear evidence and a basis from which to put in place mitigating measures and ultimately raise awareness of the problem from the environmental perspective.

With StREG's direct involvement and continuous follow-up, the proposed interventions were integrated in Lebanon Crisis Response Plan (LCRP) of 2016 under the Energy and Water Sector.⁷ This approach however proved to be insufficient to alleviate the environmental pressure affecting the different sectors in the country including solid waste, water, energy, forests, nature reserves etc. In response to this, StREG's experts ensured that the environment was mainstreamed across the entire eight sectors covered by the LCRP.

The result of StREG's instrumental efforts was the introduction of the Environment Task Force as part of the LCRP 2017 – 2020 to mainstream the environment as part of the extensive humanitarian work carried out in Lebanon in response to the Syrian crisis.⁸

The Task Force will continue to be operational beyond the project's lifespan and is good example of StREG policy interventions that have responded to immediate needs but which will continue to provide impact after the project ends.

⁷ LCRP 2016 <http://www.un.org.lb/english/lcrp>

⁸ LCRP 2017-2020 <https://www.un.org.lb/lcrp2017-2020>

5.2 Environmental Guide for Municipalities

Effective and wide reaching environmental governance can only be achieved with strong local-level support and involvement. This became even more evident under the current Syrian crisis, in which municipalities have a front line role in addressing its immediate effects. Their mandate and proximity to the environmental challenges facing Lebanon requires their active and effective engagement in environmental governance.

Since they are directly elected by citizens, municipal councils are mandated to advance environmental considerations that serve the interest of their electorate. Often, the only obstacle standing in their way is their technical capacity and expertise. To strengthen their capacity in environmental action, StREG developed a practical guide that addresses the main sectors including the management of air quality, solid waste, water resources, wastewater, land use and ecosystems (refer to List of StREG Publications).

To ensure sustainability of the process, StREG engaged with UNDP and other UN agencies and donors. Several organizations committed to complement the guide with training. UNDP is currently developing the training module and various organizations have expressed their interest to train municipalities on all aspects related to environmental management covered by the guide.

"The Municipal guide is one of the landmarks of StREG. It is a great and beneficial tool that clarifies well the roles and responsibilities of municipalities in environmental governance. For example, it sheds more clarity on municipal police's specific duties, highlights success stories and the exemplary work of some municipalities."

– Lina Yamout, Head of Service, Environmental Guidance, MoE



Figure 9: Attendees and the panel at the launch of the *Practical Guide for Municipalities to Enhance Environmental Management*

Source: StREG resources

5.3 Tackling Air Pollution

The quality of air in Lebanon is in continuous degradation and becoming a public health concern. Millions of urban dwellers are exposed to air pollution. Their health is threatened by particulate matter and air pollutants mainly spewed into the atmosphere from the transport, energy and industrial sectors.

The transport and construction sectors mainly affect the capital Beirut but thermal power plants and industrial factories, which are spread along the country's coastline are responsible for the pollution in areas such as Jiyeh, Zouk Mikael, Chekka and Selaata. In addition, the plants and factories unfortunately operate outside designated industrial zones right in the middle of residential towns.

These gases and particulates can cause respiratory problems and cancer. Persistent exposure to elevated levels of pollutants can potentially lead to more serious health conditions such as damage to the immune, neurological and reproductive systems as well as mortality due to heart and lung disease according to the World Health Organization (WHO).

Air pollution also impacts sensitive and unique ecosystems. Particulate matter, heavy metals and acid rain all significantly degrade the quality of the environment and affect agriculture. The WHO recognised in 2013 that Lebanon was one of the countries in the Eastern Mediterranean most affected by air pollution.

The health impacts come at a human and financial cost embodied in a pricy health care and economic bill. The World Bank estimated that the impact of air pollution on human health in Lebanon was in the order US\$170 million in the year 2008⁹. An American University of Beirut study, which ran from 2008 to 2010 in collaboration with Université Saint-Joseph and the National Centre for Scientific Research estimated that the cost of air pollution in Beirut alone amounts to US\$10 million.¹⁰

The Ministry of Environment has been tackling air pollution since 1996 with decisions, decrees and standards. It developed a draft law for the protection of air quality in 2005, approved by the CoM through Decree 8075/2012 and subsequently sent to parliament, where it still awaits approval.

With the support of StREG, MoE initiated in 2015 the development of a policy framework for tackling air quality in a strategic approach. Consultations with all concerned governmental academic and research institutions were initiated in view of establishing the "National Strategy for Air Quality Management". In 2017, the Strategy was submitted to the Council of Ministers for approval and will constitute the back-bone for the implementation of the draft Law for the Protection for Air Quality (refer to list of StREG publications).



Figure 10: A newly installed air quality monitoring station in Barouk, Mount Lebanon

Source: StREG resources

⁹ World Bank, 2011. Country Environmental Analysis in Lebanon

¹⁰ https://website.aub.edu.lb/communications/media/Documents/May_2011/air-pollution-Beirutis-EN.pdf

Building upon the on-going policy process and previous efforts by MoE for improving air quality monitoring in Lebanon, StREG has installed ten air quality monitoring stations and three particle monitoring stations, one calibration laboratory and eight standalone weather monitoring stations. Together with the five existing air quality monitoring stations, which were established by MoE in 2013, these stations have completed Lebanon's air quality monitoring network.

"The main purpose of this network is to use the data acquired to push for implementation of the draft Law for the Protection of Air Quality and its provisions."

- Hala Mounajjed, Head of Department of Air Quality, MoE

The stations transmit the data to the Ministry, which issues reports and publishes them on the website along with an air quality index. Four Ministry staff were trained to manage data as well as calibrate the stations.

The air quality monitoring network, which was set up according to international norms, is managed by MoE. The stations monitor many of the pollutant gases and particulates, following EU rules, regulation and reference methods to measure and compare results with standards.

The air quality monitoring stations were installed in different parts of the country to measure the impact of the power sector and industrial activities on health and ecosystems. They were installed in the background of big industries namely cement factories, power plants and quarries, as well as natural sites. StREG also established a calibration lab at the Industrial Research Institute (IRI) to standardise the process.

As part of a national fire prevention strategy for protected areas and fire prone sites, the weather stations were installed in zones known to be predisposed to wild fires. The stations provide data on relative humidity, wind speed and direction, temperature and precipitation.

The stations are operational and prompting wide and positive national collaboration and dialogue with academic institutions and municipalities who are eager to access the data, which will be readily available on MoE's website on monthly basis starting end 2017. This collaborative work with all concerned stakeholders was also adopted in the development and implementation of the National Strategy for Air Quality Management.



Figure 11: Overview of the air quality monitoring network provided through StREG
 Source: Air Quality Department (MoE)

5.4 Enhancing Solid Waste Management

Assessment of Municipal Solid Waste Practices in Lebanon

The solid waste situation in Lebanon has been highly problematic. It led to a national crisis and scenes of major public discontent in 2015. In the absence of political consensus over a clear vision and a way forward, the country ran on an “emergency plan” for 20 years. In recent years, the government developed several plans to manage solid waste in the country.

To support the government in its quest for a viable solution, StREG developed and updated a baseline assessment of the current solid waste situation in Lebanon contextualising the matter in a historic background. The assessment provides different options, scenarios and technologies that the government can adopt to manage solid waste. StREG complemented this baseline study with a focused analysis of the Waste-to-Energy technology and its potential use (refer to List of StREG Publications). The analysis provides recommendations to policy makers and was presented to key stakeholders to support their decision-making process.

Assessment of Health Impacts of the Naameh Sanitary Landfill

For almost 20 years, around 2,000 tonnes of waste per day were collected from Beirut and Mount Lebanon, which it landfilled in Naameh, a Sanitary Land Fill located south of the capital. As the waste quantities started exceeding the capacity of the landfill, this raised health concerns at the Council of Ministers and for the population at large.

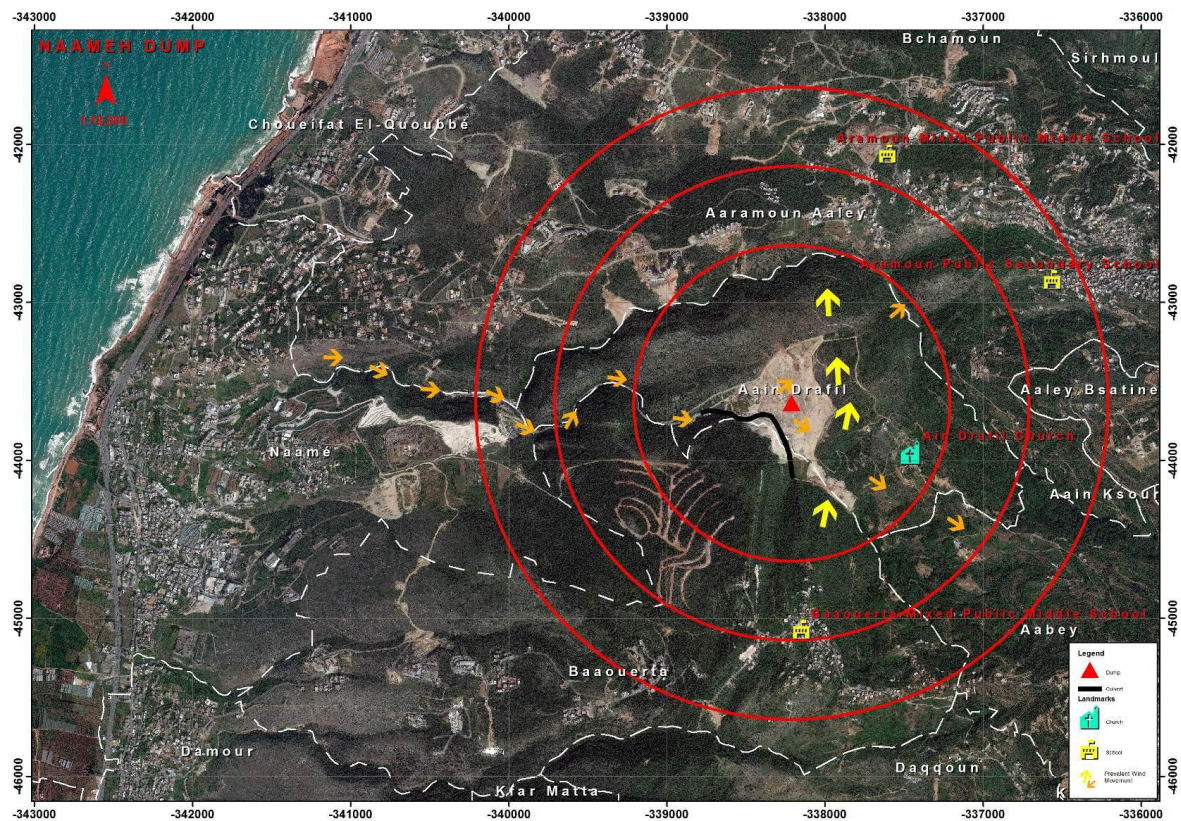


Figure 12: Satellite image showing Prevalent Wind Directions and Potential Human Receptor Areas near Naameh Sanitary Landfill Site

Source: Health Risk Assessment of Sanitary Land Fills: Site Characterisation & Exposure Pathway Report (refer to List of StREG Publications)

While the operator of the landfill is requested to report on the environmental measurements related to Nammeh's operation, MoE is required to validate this data and monitor the potential environmental health impact of the landfill. In order to do this, StREG brought together a team of high-level experts to establish an assessment methodology which should be complemented by needed laboratory analysis to implement in line with the international good practice. The entire process, from technical and financial levels, constituted an important learning curve and created capacity and a precedent at the Ministry to replicate the experience in other landfills.

"In the management of solid waste, it is our responsibility to ensure that the environment and the health of the citizens are given priority. In fulfilling this mandate, StREG has provided methodological guidance according to best international practice, covering important aspects of SWM such as EIA guidelines for Waste-to-Energy plants".

– Bassam Sabbagh, Head of Service of Urban Environment, MoE

5.5 Fighting Land and Ecosystem Degradation

As a general methodology and for each sector or issue tackled, StREG carried out initial analysis, developed as necessary good practice guidelines, road maps, protocols or recommendations, and translated the latter into legislation.

Protected Areas

Lebanon boasts 15 protected areas covering 3% of the Lebanese territories. They are the main conservation tool in a country exposed to fierce competition over resources. Protected areas are an attempt to protect precious natural resources, vegetation cover and wilderness from a wide array of threats most important of which is urban encroachment. According to the SoER, urbanization is the main driver of habitat loss followed immediately by forest fires, agricultural expansion, overgrazing, quarrying, climate change and conflict. With mounting economic pressure, aggravated by the explosive refugee situation and dwindling oil prices in the region, urbanisation and growth of cities and villages reflects the global trend where people are instinctively drawn to successful and attractive natural sites.

These dangers present themselves in a context marred by lack of data on land use, land cover and land tenure as well as very poor master planning. More than 50% of the country is still not surveyed and boundaries are not demarcated including in Protected Areas. This situation is juxtaposed to the fact that in Lebanon, private property is sacred. This sanctity of the private is anchored in the country's constitution. The highest level of the law stipulates that no land can be taken away from its owner except in cases as established by law and only after the owner has been duly and fairly compensated. In other words, land owners have a free hand to develop property even if this affects fragile and valuable ecosystems. According to the SoER, this situation has so far impeded sustainable land use planning, conservation and the delineation of protected areas.

StREG targeted one of the most important Protected Area contexts to treat this situation and set precedent and ground work to build on and replicate in other regions.

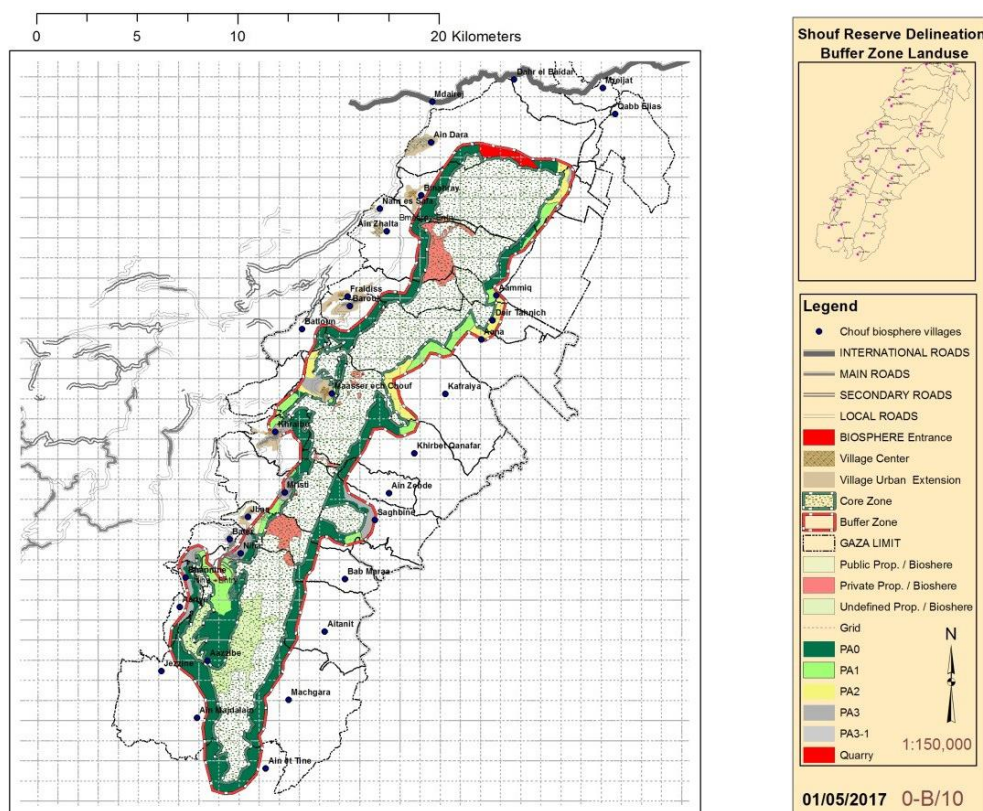


Figure 13: Map of the boundaries and buffer zone of the Shouf Biosphere Reserve

Source: Guidelines for the delineation of the Shouf Biosphere Reserve (refer to List of StREG Publications)

The Shouf Cedar Biosphere Reserve (SBR), a mountainous range of forest land surrounded by 26 villages, is the largest protected area in Lebanon. Yet despite good relations with the surrounding local communities, the management team of SBR constantly deals with challenges and threats related to development and encroachment.

With the support of StREG, the SBR was delineated, demarcating the core area and the buffer zone while identifying private, municipal and communal lands. StREG organised the buffer area using a zoning system that divides it into four categories of different levels of use and tailored to conservation needs (refer to List of StREG Publications). The integrated conservation concept allows for green development in the buffer zone of the protected area, detailing specific construction systems and certain specifications to minimise adverse impact.

"Delineation is the basis of effective management of protected areas. Without clear boundaries and an organised buffer zone, we cannot practice conservation and engage local communities."

– Nizar Hani, Department of Ecosystems, MoE; and Shouf Cedar Biosphere Reserve Manager

StREG also developed a methodology for delineating protected areas to allow replication of this important practice in other sites. StREG also addressed a recurring procedural aspect in the buffer zones of protected areas and, which concerns well's drilling. For this purpose, StREG brought on board specialist consultants to develop detailed and scientifically based guidelines for effective management of the wells in the buffer zones of protected areas (refer to List of StREG Publications).

Through the delineation work and other support, StREG has yielded a positive influence on the governance of Protected Areas in Lebanon as a whole.

Quarries

The quarry sector is one of the thorniest sectors in Lebanon. The sector is vastly chaotic and unregulated with almost complete absence of law enforcement. Disorganization in planning and maintenance of quarries is not helped by the fact that several institutions are charged with its governance. The Ministry of Environment, the Ministry of Interior and Municipalities and the Ministry of Energy and Water have the principal responsibility to regulate quarries, while the latter is required to issue permits when quarries can impact water sources. Often, the Ministry of Interior and Municipalities would issue permits to quarries without coordination with the Ministry of Environment.

Continuous war and destruction driving the demand for construction material have complicated the situation further and contributed to the unchecked proliferation of quarries. While existing regulations allows exploitation of the eastern Lebanese mountains, known as the Anti-Lebanon Mountain Range, the western mountains, which provide the main water reservoirs, are illegally exploited to extract sand. Furthermore, demand for rock is expected to further shoot up with the end of Syrian war and cement factories are already bracing themselves for this eventuality.

A recent study counted 1,278 quarries spotting the Lebanese landscape that produce aggregates, rock and sand.¹¹

In 2002, a decree established the National Council for Quarries, composed of nine institutions and chaired by the Ministry of Environment. The decree presented a long awaited *National Master Plan for Quarries*, which designated the anti-Lebanon Mountain range as a quarrying site. It also requires quarry contractors to rehabilitate the site at the owner's expense by terracing and planting after completion of extraction and imposes fines in cases of non-compliance.

Unfortunately, enforcement of these regulations remains lacking and usually very little rehabilitation of quarries ensues. Hundreds orphaned and abandoned quarries are scarring the face of this small Mediterranean country. The impacts of quarries have gone beyond the visual effect. They have removed topsoil, destroyed valuable vegetation cover, altered ecosystems, caused air and water pollution, endangered water sources and drove down real estate value. While StREG is unable to tackle the country's political entanglements, it worked closely on providing best practice guidelines to tackle shortcomings and legal strengthening.

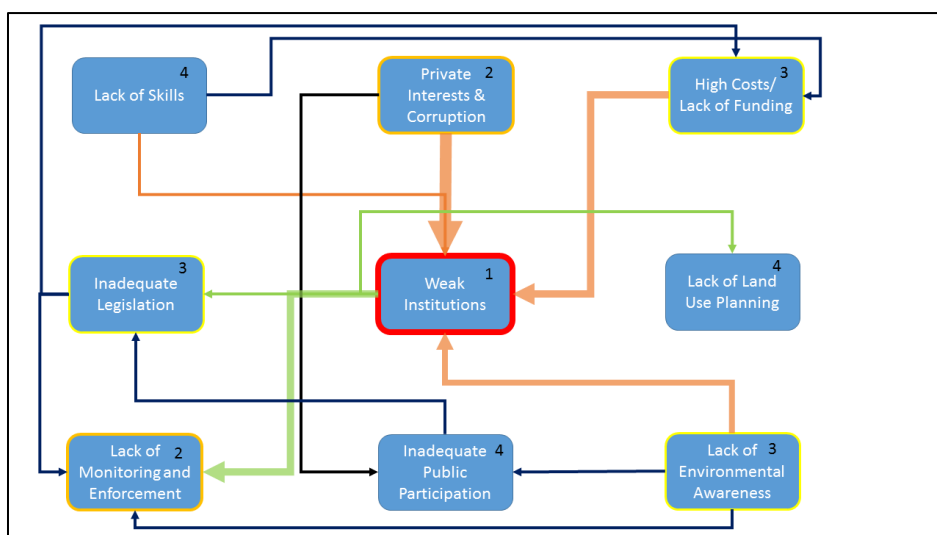


Figure 14: Relationships between barriers to improved environmental management in the quarry sector in Lebanon

Source: Measures of Improving Environmental Performance of Quarries (refer to List of STREG Publications)

¹¹ Darwish, T., Khater, C., Jomaa, I., Stehouwer, R., Shaban, A. and Hamzé, M., *Environmental impact of quarries on natural resources in Lebanon*. July 2010

StREG experts compared practices in Lebanon with those implemented internationally. This exercise reconfirmed the gaps in controlling erosion, optimising extraction (more outputs, less impacts), managing dust, minimising explosives in the blasting process, protecting water sources, and managing emerging waste. The analysis provided authorities with a clearer view of the deficiencies in the quarries system (refer to List of STREG Publications).

StREG also revised a draft Quarry Framework Law, which was prepared by MoE in 2006. When passed by parliament, the law will put forth a comprehensive and integrated system for quarries management in Lebanon. The Ministry staff view this as a crucial step that will significantly strengthen their enforcement capacity *vis-à-vis* the quarry sector.

"All we currently have for the quarry sector are decrees, which are not sufficient. This law will put us in a strong position in terms of enforcement."

– Nadim Mroueh, Head of Service of Natural Resources, MoE

In favour of the provisions of the law, StREG recommended Best Practice Guidelines to ensure the sound management of the quarries sector in Lebanon. These guidelines should be issued by the National Council for Quarries. The guidelines tackle planning, ways to deal with local communities surrounding the quarries, safety and security, the impact on land, water and air, noise and vibration, transport and how to rehabilitate the plant.

Fostering the responsibility of the investor, the guidelines require a feasibility plan covering a description of the project, market conditions, operation, regulatory requirement, mitigation measures, site development, operation and reclamation. Importantly and forward thinking, the investor should also identify impacts on the local community and establish good relations with them. To emphasise protection of natural resources, the guidelines stress the need for proper drainage with a focus on maintaining natural springs as sensitive and valuable ecosystems.

6 LONG TERM BENEFITS & OUTLOOK

The benefits of the foundations and infrastructure laid down by StREG will be felt in several sectors for many years to come.

Improved air quality through an established strategy and action plan coupled with the air quality monitoring network to monitor pollution is a vital step forward in providing clean air, an integral part of the life support system from which the country ensures the health and well-being of its citizens and naturally the surrounding environment. This will bring Lebanon in line with international standards and commitments. The strategic choice for StREG to take lead on this with the support of the EU is commendable.

The weather stations will also help prevent forest fires that destroy the country's air purifiers and valuable ecosystems. Protecting the forests will prevent desertification, enhance water provision and quality and ensure food security and ultimately secure better health for people.



Figure 15: Tannourine Protected Area

Source: <http://www.moe.gov.lb/ProtectedAreas/preview.asp?postcardId=29>

The policy outcomes of StREG effectively mainstreamed the environment in the government's wider development planning process especially through the initiation of a process for the development of a National Sustainable Development Strategy. It is impressive in a country like Lebanon with its generally liberal policies and profit driven culture to see environmental planning being considered at the top executive level of the Presidency of Council of Ministers. This of itself is an achievement and its focus on longer-term objectives is significant for mainstreaming environmental issues, and will have positive spill-over benefits across many sectors.

Working in parallel with the top level and key international organizations on the one hand and with the municipalities on the other, StREG weaved in key environmental concerns widely and deeply. It equipped the different levels with the necessary knowledge foundation and technical basis to ensure healthy living through cleaner air and water, better managed land and ecosystems and safely treated and disposed waste.

StREG established paths for science-based policy formulation through establishing methodologies and protocols to assess the health impacts of landfills and providing innovative analysis of the impact that sudden population growth, such as through the Syrian crisis, can have on limited resources. This evidence will allow effective and measurable action that will drive protection and mitigation. Creating a body that will play an integral role in the national response to the Syrian crisis is a landmark of sustainability.

By demarcating the country's largest and most important natural site housing its core natural and cultural heritage, StREG accomplished survival, health and well-being for many generations to come. The Shouf Cedar Biosphere Reserve is a real sustainable development model, an asset that brings national benefit to beyond the

70,000 people living in its surrounding. The Shouf reserve receives thousands of visitors per year eager to benefit from the peace and healing power of the Cedars and puts Lebanon distinctively on a global tourism map. The reserve, which covers 50,000 ha of land brings freshwater and ecosystem services to its 24 villages and beyond as well as protects various species of birds, mammals and plants. Protecting such an asset through clear boundaries and establishing guidelines for sustainable architecture and construction is an important leap forward for conservation and green growth in Lebanon.

The legal infrastructure that StREG helped to build coupled with staff training will enhance protection of valuable resources. The legal framework advanced by StREG will resolve long-standing problems. This will bring marked health and quality of life benefits to the Lebanese people. This legal framework will decrease the toxic and drastic impacts of health care and hazardous waste. Through the legal work it accomplished, StREG introduced the culture of placing standards at the heart of laws and using financial instruments to advance environmental protection through market mechanisms hence practically quantifying pollution and environmental protection. StREG pioneered this concept that has proven its effectiveness internationally.

The contribution in building an environmental police force will forever change the landscape of environmental violations, law enforcement and environmental protection in the country. Effective prosecution and punishment of environmental violations will instil a different culture and enhance overall environmental and economic resilience. In the hearts and minds of every Lebanese citizen, the environment will eventually become an integral and inviolable body such is the case in Nordic countries.

Finally and most importantly, StREG's administrative interventions in automation and ICT infrastructure can speed up the Ministry's response and hence drastically reduce pollution and the destruction of the natural environment that is now advancing faster than any reaction driven by manual transactions. With a modern and organised system and archives, the Ministry will be able to perform effectively and efficiently. It will better respond and service the interests of the citizens and will be positioned as a resourceful and crucial body in the sustainable development of the country.

"The MoE has faced an uphill battle since its inception in 1993 to ensure environmental governance. The StREG offered an opportunity to tackle some of these constraints in a systematic manner, and one which dealt with the financial, administrative, legislative and technical discrepancies. It is important that such efforts are sustained in the current challenging context facing environmental management in Lebanon".

- Manal Moussallem, Senior Environmental Advisor, MoE

Governance is how society or groups within it, are organised to make decisions, and for which three big issues come to the fore: (i) Who has a voice in making decisions, (ii) How are decisions made, and (iii) Who is accountable. With the new concepts of governance, rigid government control over data, decisions, and the social agenda is just no longer tenable¹².

While StREG has followed up on previous environmental governance initiatives at MoE in coordination with other concerned stakeholders, and strengthened the fundamental aspects of governance systems needed in Lebanon, the continuation of such efforts is essential to meet the challenging situation which MoE is facing on daily basis. The long-term planning for responding to these challenges remains a priority for MoE, and the means to meet these long-term plans can only be achieved with the continuous support of the Lebanese Government and of the donor community.

The experience and lessons captured in the implementation of the StREG programme constitute the basis for much needed future interventions to continue the demanding path for strengthening environmental governance in Lebanon.

¹² <https://iog.ca>

7 LIST OF STREG PUBLICATIONS

To access all STREG publications please visit www.stregmoe.gov.lb

TECHNICAL DOCUMENTS

Automation and Administrative Capacity

- MoE's Regional Departments Capacity Needs Assessment, 2014
- Proposed Training Programmes for MoE Quality Management and Leadership, 2016
- Implementation Roadmap for MoE Automation System, 2017
- Gap Analysis for the MoE in compliance with the ISO 9001: 2015 Certification, 2017

Environmental Fiscal Instruments

- Environmental Fiscal Instruments for Quarry Management, 2014
- Environmental Fiscal Instruments for Solid Waste Management (and recycling), 2014

EIA/EMP Trainings

- Training Materials on Environmental Impact Assessment, 2017
- Training Material on the development and monitoring the implementation of the EMPs as part of the EIA process, 2017

Environmental Policy Documents

- Environmental Assessment of the Syrian Conflict and Priority Interventions, 2014
- Updated Factsheet of the Environmental Assessment of the Syrian Conflict and Priority Interventions, 2015
- National Strategy for Air Quality Management, 2017
- Towards a National Strategy for Sustainable Development: Baseline Summary and Way Forward, 2017
- Practical Guide for Municipalities to Enhance Environmental Management, 2017

Protected Areas

- Establishing Conditions and Monitoring Procedures for Water Extraction Within Buffer Zones of Protected Areas in Lebanon, 2017

Quarries

- Measures of Improving Environmental Performance of Quarries in Lebanon, 2016

Solid Waste Management

- Assessment of Solid Waste Management Practices in Lebanon in 2015
- Health Risk Assessment of Sanitary Land Fills: Site Characterisation & Exposure Pathway Report, 2015
- Monitoring Protocol for the Health Risk Assessment of Sanitary Land Fills, 2015
- Waste-to-Energy as an element of Waste Management in Lebanon: Options and Conditions, 2017

LEGAL DOCUMENTS

Environmental Policy

- Application Decree 3989/2016 (related to Environmental Police)
- Application Decree 167 of 2017 pursuant to Article 20 of Law 444 on Environment
- Draft Ministerial Decision on the Emissions Standards

Protected Areas

- Draft Ministerial Decision on the Detailed and General Conditions for Construction in the buffer zone of the Shouf Biosphere Reserve
- Draft Ministerial Decision on the Guidelines for the Delineation of Protected Areas
- Draft Ministerial Decision on wells' drilling in the buffer zones of protected areas

Quarries

- Draft Law/Decree for Quarries

Solid Waste Management

- Draft Application Decree of Hazardous Waste Management and two related Ministerial Decisions
- Draft Ministerial Decision on Compost
- Draft Ministerial Decision on Environmental conditions and permitting of the Health Care Waste treatment facilities
- Draft Ministerial Decision on Environmental conditions for the transport of Health Care Waste
- Draft Ministerial Decision on Petroleum Coke

Water and Wastewater Treatment

- Draft Ministerial Decision on Sludge Reuse
- Draft Ministerial Decision on Waste Water Reuse



© 2017 Support to Reforms – Environmental Governance Programme

Disclaimer: This publication was produced with the support of the European Union. The contents of this publication are the sole responsibility of the authors and can in no way be taken to reflect the views of the European Union.

This publication was printed on recycled paper