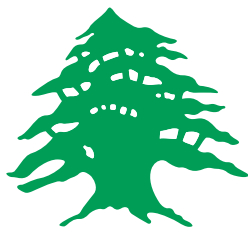


NATIONAL REPORT TO THE UNITED NATIONS CONFERENCE ON SUSTAINABLE DEVELOPMENT (RIO+20)



REPUBLIC OF LEBANON

Sustainable Development in Lebanon: Status and Vision

June 2012

NATIONAL REPORT TO THE UNITED NATIONS CONFERENCE ON SUSTAINABLE DEVELOPMENT (RIO+20)

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COORDINATION AND SUPERVISION:

Rio+20 Follow-Up Committee:

- Ministry of Environment
 - Ministry of Foreign Affairs
 - Ministry of Social Affairs
 - Ministry of Economy and Trade
 - Civil Society Organizations
through the Arab NGO Network for Development
 - United Nations Development Programme
-

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for the Ministry of Environment, as the UNCSD focal point,
with the support of UNDESA and the United Nations Development Programme

“The future we want for Lebanon”

While the world leaders are getting ready to meet in Rio De Janeiro between the 20th and the 22nd of June, to take part in the United Nations Summit on Sustainable Development (Rio + 20), which is supposed to define the world track of sustainable development for the coming decade through an outcome document entitled “The Future We Want”, the Lebanese are getting ready to draw the future they wish for their dear country through this report on the reality of sustainable development in Lebanon and the future vision. For the first time, this report combined the orientations of the various Lebanese parties, namely the government, the civil society and the private sector.

As unification is the main feature of the report, so it is for the Future We Want for our country Lebanon: a unifying future first and foremost, for it alone is capable of addressing the other challenges related to sustainable development and detailed in this report, particularly in our Arab region where the development challenges are not merely limited to conventional issues such as social development, economic prosperity and environment protection, but rather begin with the prerequisites of development, namely sovereignty, security and freedom.

A unifying future in a country that hosts, within a tiny area, an unparalleled cultural, confessional and political plurality;
A unifying future for a community widely spread all over the world;
A unifying future under a democratic system that we boast about since Lebanon’s Independence in 1943;
It is a vision that is not hard to achieve, if there is a unifying will, exactly as it was available for the preparation of this national report.

The National Report for the United Nations Conference on Sustainable Development (Rio + 20) presents the current situation as is, in a normal description which, though it is hard most of the times, highlights the achievements and failures, strengths and weaknesses, opportunities and risks. The report also tackles some proposals for the future vision, which may be a foundation for a constructive dialogue among all the parties, in view of delving deeper into the available economic, social and environmental options, and integrating them in the core of the comprehensive development process.

This report also offers an opportunity to reaffirm Lebanon’s commitment towards sustainable development, in words and in deeds, through the adoption by the Lebanese state of a series of laws and decrees set out in the 1992 Rio Declaration, and the constant endeavours to implement them efficiently through integrated strategies, programs and projects in various sectors. Furthermore, the report went beyond the national scope to propose some global recommendations, highlighting the principle of common yet unequal responsibilities and interests between the countries. We hope that these suggestions will contribute to the improvement of international governance in sustainable development, which in turn would promote the institution-building, and activate the partnership among various groups.

Fellow Lebanese,

Prior to this world summit, and on the occasion of the World Environment Day, we are all called to a conscience awakening. Our environmental behaviour today will draw Lebanon’s future geography and history for the coming generations. The Rio + 20 Summit is a milestone on the path that we took in re-placing Lebanon on the international map and stressing on its civilizational and cultural status in the world. It is a call to make a change in behaviour towards the environment at both individual and collective levels, so we can affirm that Lebanon is not only a country and a message of freedom and coexistence, but also message of development.

June 5, 2012

General Michel SLEIMAN
President of the Republic of Lebanon

Acknowledgements

On October 6, 2011, the Lebanese Prime Minister Najib Mikati mandated a ministerial committee composed of the Ministers of Environment, Mr. Nazem El-Khoury, Foreign Affairs, Mr. Adnan Mansour, Social Affairs, Mr. Wael Abou Faour, and Economy and Trade, Mr. Nicolas Nahas, to lead the preparation of Lebanon's National Report to the United Nations Conference on Sustainable Development (Rio+20).

On December 22, 2011, the Ministry of Environment together with the United Nations Development Programme appointed a National Consultant to assist the ministerial committee in drafting the report based on a rigorous methodology and a public consultation process. The consultant conducted interviews, collected and reviewed relevant studies and reports, and submitted in February 2012 a draft Stocktaking Report to the committee. This report was disseminated widely and debated during four roundtable discussions organized by the Ministry of Environment and UNDP bringing together a range of knowledgeable stakeholders from line ministries, research organizations, civil society and the private sector.

The consultant subsequently prepared a draft National Report that was presented and discussed at a well-attended consultation workshop organized by the Arab NGO Network for Development in Beirut on May 3-4, 2012. Close to 100 participants from all sectors deliberated over the course of two days on sustainable development issues and options in Lebanon mainly, and the global level.

This Final Report was made possible thanks to the intellectual support of and writing contributions from dozens of people who showed unwavering commitment to helping articulate Lebanon's position vis-à-vis sustainable development in Lebanon and beyond. Because this report consolidates a wide range of views, it is addressed to all Lebanese who take pride in our country's pluralistic society and freedom of expression, and who appreciate the interconnectedness of our shrinking world.

The ministerial committee wishes to thank all those who contributed to the public discourse on sustainable development and welcomes the opportunity to resume this discourse after the summit to consolidate the ideas and to harness the momentum created during the preparation of the National Report. The committee expresses its full support for all the members of the Lebanese delegation who will participate in the Earth Summit in Rio (June 20-22, 2012) under the leadership of HE the Prime Minister. Last but not least, the committee extends its greatest appreciation to HE The President of the Republic, General Michel Sleiman, for hosting the launching of this report at the Presidential Palace, under his patronage, on the World Environment Day (June 5, 2012).

For your comments, please write to rio_20@moe.gov.lb.

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List of Acronyms and Abbreviations

BDL	Banque Du Liban	NEEAP	National Energy Efficiency Action Plan
CAS	Central Administration of Statistics	NEEREA	National Energy Efficiency and Renewable Energy Account
CBD	Convention on Biological Diversity	NGO	Non-Governmental Organization
CDR	Council for Development and Reconstruction	NLUMP	National Land Use Master Plan
CEA	Country Environmental Analysis	NMVOC	Non-Methane Volatile Organic Compounds
CEDRO	Country Energy Efficiency & Renewable Energy Demonstration Project for the Recovery of Lebanon	NOU	National Ozone Unit
CFC	Chlorofluorocarbon	NOx	Nitrogen Oxides
COM	Council of Ministers	NWSS	National Water Sector Strategy
DSWH	Domestic Solar Water Heater	OMSAR	Office of the Minister of State for Administrative Reform
EDL	Electricité du Liban	PCBs	Polychlorinated Biphenyls
EFL	Environmental Fund for Lebanon	PM	Particulate Matter
EIA	Environmental Impact Assessment	POPs	Persistent Organic Pollutants
EU	European Union	PV	PhotoVoltaics
FIT	Feed in Tariffs	PWD	Persons with Disability
GBA	Greater Beirut Area	SEA	Strategic Environmental Assessment
GDP	Gross Domestic Product	SEEL	Supporting the Judiciary System in the Enforcement of Environmental Legislation
GEF	Global Environment Facility	SELDAS	Strengthening/State of the Environmental Legislation Development and Application System in Lebanon
gha	Global hectares	SO2	Sulfur Dioxide
GiZ	German International Cooperation	UNCCD	United Nations Convention to Combat Desertification
GOL	Government of Lebanon	UNCRC	United Nations Convention on the Rights of the Child
HCFC	Hydrochlorofluorocarbon	UNCSD	United Nations Conference on Sustainable Development
ILO	International Labor Organization	UNDP	United Nations Development Programme
IRI	Industrial Research Institute	UNEP	United Nations Environmental Programme
LARI	Lebanese Agricultural Research Institute	UNFCCC	United Nations Framework Convention on Climate Change
LCEC	Lebanese Center for Energy Conservation	UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East
LGBC	Lebanon Green Building Council	USAID	United States Agency for International Development
LL	Lebanese Lira	WB	World Bank
MDGs	Millennium Development Goals	WHO	World Health Organization
MOA	Ministry of Agriculture	WWTP	Wastewater Treatment Plant
MOE	Ministry of Environment		
MOET	Ministry of Economy and Trade		
MOEW	Ministry of Energy and Water		
MOF	Ministry of Finance		
MOFA	Ministry of Foreign Affairs		
MOIM	Ministry of Interior and Municipalities		
MOJ	Ministry of Justice		
MOSA	Ministry of Social Affairs		
NEAP	National Environmental Action Plan		

I. Sustainable Development in Lebanon

Twenty years after the first United Nations Conference on Environment and Development (UNCED) in Rio, and 10 years after the World Summit for Sustainable Development in Johannesburg, world leaders are congregating once again in Rio to participate in the United Nations Conference on Sustainable Development (UNCSD). Leaders and officials are expected to present their achievements related to sustainable development and to articulate their vision going forward.

Discussions will revolve around the obligations of member states and the commitments made in Rio twenty years ago when the international community decided to address economic, social and environmental issues concomitantly. The summit is being held at a time of global turmoil and instability. Financial markets are in tatters, economic systems are failing, agricultural systems cannot keep up with population growth, climate change is affecting ecosystems and our natural resource base, and energy prices are spiraling out of control.

Developing countries (G77) including Lebanon believe that there is a preponderant need to address the root causes of today's crisis which can be linked to global economic systems and processes. The avid pursuit of growth led development based solely on productivity and profit, without due consideration for the quality of growth and the vitality of productive sectors and the redistribution of economic returns to ensure a good quality of life for all, is doomed to failure. This economic model also does not embrace equity considerations in the distribution of wealth and services, as well as economic benefits. Since 1992, disparities are growing between north and south, between rich and poor, between men and women, and between urban and rural. The current economic model has largely impeded the pursuit for sustainable development and should therefore be revisited.

Despite the prevailing global instability and setbacks, the 1992 Earth Summit marked an important milestone in environmental, social and

economic affairs worldwide and in Lebanon as well. The momentum created by the Rio conference led to several important initiatives and was clearly the impetus for environmental programming and planning in Lebanon. Noteworthy achievements include the establishment of the Lebanese Ministry of Environment in 1993 (Law 216/1993), the designation of 14 protected areas in the period since 1992 covering almost 2.5 percent of the Lebanese territory, the gradual introduction of environmental diplomas in Lebanese universities, and the enactment of several important environmental regulations.

The path to sustainable development in Lebanon since 1992 has been fraught with difficulties and challenges, both external and internal. Externally, several wars have eroded national resources and Lebanon's ability to plan for and manage sustainable development challenges. Three devastating wars with Israel (1996, 1999 and 2006) displaced thousands of people and also destroyed homes and primary infrastructure on a large scale. Lasting 35 days, the war in 2006 also caused the worst environmental oil spill in Lebanon's history causing \$200 million in oil-related damages. These events altered national priorities and often delayed sustainable development initiatives by siphoning away government (and donor) resources for emergency response and reconstruction efforts. Wars and related damages have also aggravated poverty issues and delayed social reform programs.

Lebanon's path towards sustainable development was also derailed by regional factors. In particular, the global financial crisis, partly brought about by a failing real estate model, affected the Lebanese economy and distorted its real estate market. Whereas real estate crashed in the region, the Lebanese real estate market experienced unprecedented growth and kick-started a construction frenzy. Soaring real estate prices are impacting economic sectors and have severely limited the ability of the Lebanese people, particularly her youths and newlyweds, to buy or even rent a home.

Although Lebanon has not experienced an Arab Spring per se, the effects of people power and regime change in the Arab World have affected Lebanese society. The Arab Spring was driven not only by political, economic and social stresses in the Middle East, but also by environmental, population, climate and food stresses¹. Continued instability since January 2011 is affecting trade routes and volumes with neighboring countries and slowing down tourism. It is therefore paramount that the Government of Lebanon (GOL) draws the lessons of the Arab Spring and accelerates the political, economic and social reform process in Lebanon. The Arab Spring is not only about regime change, it is equally about rebuilding state institutions, reshaping economic and financial systems, and adopting new policies for social development to provide basic goods and services to all citizens while consolidating human rights and ensuring equity. The turmoil that Lebanon is witnessing today demands a complete paradigm shift based on a comprehensive approach.

Civil society organizations contend that the government's piecemeal approach to development, usually focused on individual economic sectors separately (tourism, agriculture, industry, etc.) and/or basic services (health, education, transport), is counter-productive and cannot achieve sustainable development goals. Rather, Lebanon should aim to approach development by looking at all sectors in a holistic and comprehensive manner, by understanding societal aspirations, and by strengthening national identity. For example, instead of focusing exclusively on *free* trade agreements (bilateral, regional and multilateral) including WTO accession (in progress since 1998), the GOL should articulate a national strategy for developing productive sectors (including agriculture) and services. It must embrace the principles of *fair* trade and support the global movement towards the fair exchange of goods and services. Rather than spending time and resources to support a specific subsector in agriculture (e.g., tobacco, dairy), the GOL should set out



¹Arab awakening began in Tunisia with a fruit vendor who was harassed by police for not having a permit to sell food — just at the moment when world food prices hit record highs.

a comprehensive framework for revamping the agricultural sector and mobilize the necessary resources to implement it through inter-ministerial coordination.

It is important to admit that improved economic and social planning for local development is futile so long as corruption remains rampant and impunity persists. The GOL must make a stern commitment to enhance governance, empower institutions and local authorities, and reduce corruption in all sectors (political, economic, financial, social and environmental). It must set the example by rethinking and reforming governance. Lebanon's current rank on the Corruption Perception Index is 134 out of 183 listed countries (this index is compiled by Transparency International, a global coalition against corruption). Improved and more effective governance is achievable through administrative decentralization, and by empowering local elected authorities to become vectors for sustained rural development. The Presidency of the Council of Ministers has prepared a 7-point action plan for social and economic reform (March 2012): (1) managing public debt and financial reform; (2) revitalizing the private sector; (3) enhancing infrastructure; (4) human development; (5) regional and rural development; (6) institutional and administrative reform; and (7) other support factors. The GOL must engage all ministries, as well as civil society and private sector groups, in those deliberations to produce a meaningful and effective reform package with maximum buy-in.

The UNCSD in Rio will attempt to achieve the following strategic objectives: (1) renew the political commitment to sustainable development, (2) evaluate progress achieved to date as well as outstanding shortcomings in achieving sustainable development objectives, and (3) confront new and emerging challenges. Lebanon, as part of the G77 group, is keen on reaching these objectives by addressing the fundamental issues impeding social, economic and environmental sustainability.

II. Social Development and Poverty Alleviation

Between 1992 and 2012, Lebanon's resident population increased by an estimated 25%, from approximately 3.5 million to 4.2 million, including an estimated 400,000 Palestinian refugees. While the actual population growth is probably higher (about 1-2.5% annual growth rate), the concomitant rate of emigration triggered by economic goals and/or security incidents has effectively limited net population growth. Lebanon's age structure is a clear determinant of socio-economic status and living conditions (see figure 1). With half of its population below the age of 29, and 24% percent living near or under the poverty line (MOSA, 2011), the GOL recognizes the need to create jobs and improve living conditions for many people.

Living conditions in Lebanon are difficult for a large segment of society, and poverty is a serious problem despite some apparent improvements in the last decade. While the assessment of poverty is a very complex matter, preliminary poverty calculations on the basis of the Living Conditions Index have revealed that in 2004, an estimated 5% of the households live in extreme poverty (as compared to 7% in 1995) and 19% of households live in relative poverty (28% in 1995). This shows a 6% improvement during one decade in the fields of education, housing, and access to water and sanitation. However, income related indicators have worsened considerably and poverty continues to be unevenly distributed. It is more prevalent among agriculture workers and unskilled workers in services, construction and industries, many of whom are illiterate or semi-illiterate.

There is no magic cure to poverty. The root causes of poverty are wide and complex and can best be addressed holistically, notwithstanding the effects of war and recession on the local economy and the government's ability to provide basic services to its people.

The GOL is currently implementing a \$28 million National Poverty Targeting Program to provide direct support to the neediest (PCM, 2012). Launched in 2009, the program uses proxy indicators to assess the income of 91,000 poor families living in poverty pockets across the country. Using the services of 400 social investigators spread across

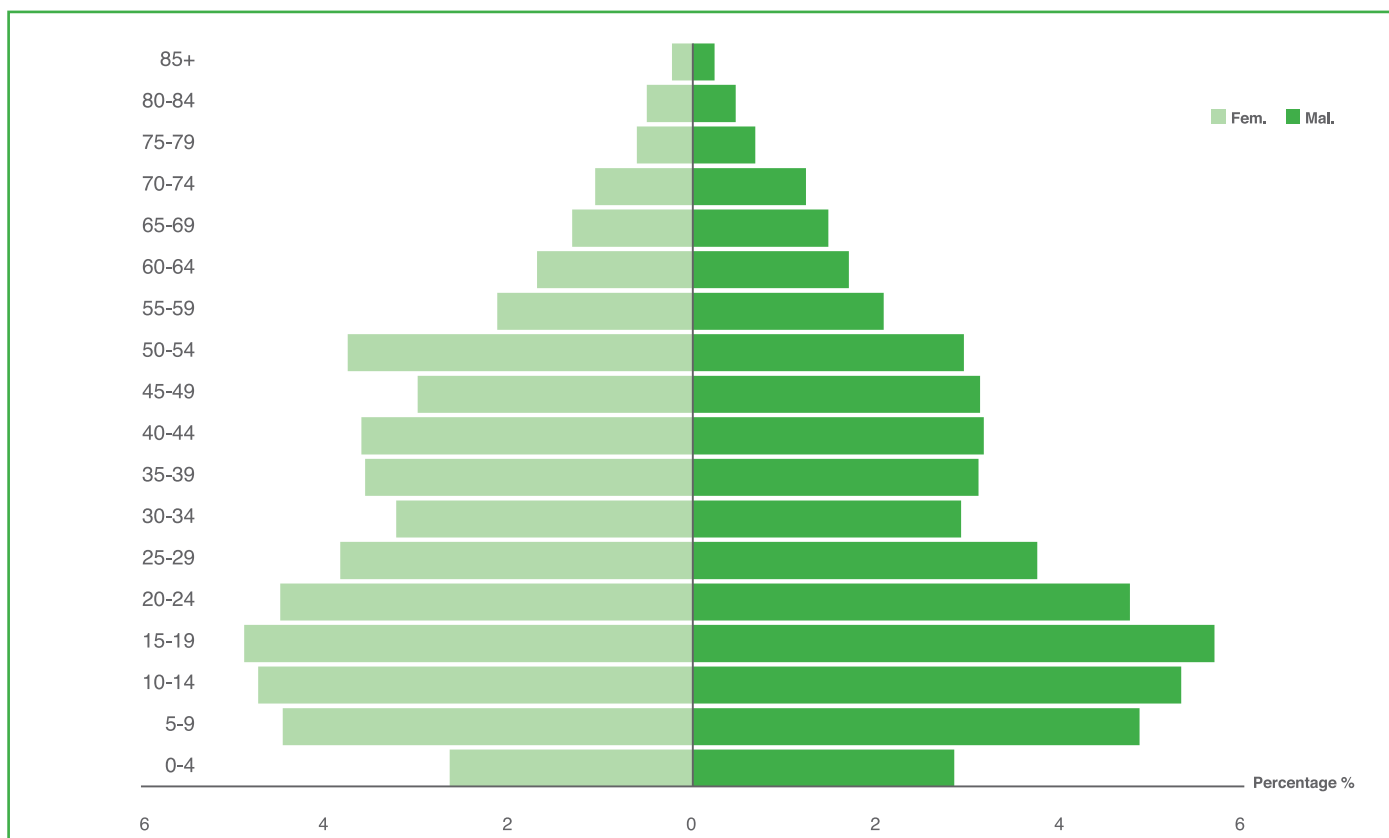


98 social service centers, individuals can apply for subsidies through a rigorous screening program involving four line ministries (Finance to verify fixed assets, Interior to verify car ownership, Public Health to verify insurance and social security data, and Education to verify schooling data), under the leadership of the Presidency of the Council of Ministers. Resolutely determined not to provide direct cash transfers as a means to alleviate poverty, the GOL opted to address poverty through a subsidy program involving health care, schooling and electricity. The program will follow-up on and manage each case to assess the impact of the subsidy program on poverty. Based on the results of this start-up program, the GOL will scale up the poverty targeting program and expand its coverage.

Meanwhile, the arduous work of civil society organizations, charity networks and philanthropic institutions across all regions in Lebanon has without a doubt alleviated the impact of poverty on individuals and families and helped avert a social crisis. While it may be difficult to assess the extent and magnitude of poverty alleviation efforts and programs in the country by the informal sector, these efforts are nonetheless significant and their reach is noticeable.

More importantly, Lebanese civil society believes that poverty cannot be addressed by targeting specific segments of society alone and that improving the income of the poorest families

Figure 1 – Age Structure in Lebanon



will not stop the intergenerational transfer of poverty. Instead, poverty can best be addressed by reducing socio-economic burdens through the provision of affordable and high-quality basic services including clean water, energy, public transportation and housing as well as health and education including free schooling. Poverty eradication also necessitates building human capital and providing societal choices to people living in cities and in rural areas.

Clearly, Lebanon still needs to evaluate and compare the strengths and weaknesses of targeted programming to alleviate poverty versus providing universal coverage, and the provision of direct cash assistance versus providing basic services and products for free. The best way to effectively evaluate and compare these models is for the GOL and civil society groups to meet and share their respective databases on poverty clusters and to agree on performance indicators for poverty alleviation. Improved coordination will reduce the duplication of efforts and will optimize resources markedly.

Another socio-economic debate that has gripped Lebanon for several years is the rising cost of living and corresponding income levels. Labor unions have been advocating a significant increase in the minimum wage and higher salaries. Without contestation, lowest income groups are unable to cope with the higher cost of living and are experiencing a significant decline in living conditions. Economic interest groups (SMEs, industries, chambers of commerce and trade organizations) however have been warning against unilateral salary increases in the absence of a more comprehensive program for development. Rightfully, they argue that wage increases will only benefit a particular segment of society (employees and civil servants), while other segments of society will not benefit (independent professionals, the unemployed, and retirees). In fact, a unilateral salary increase will harm non-salaried people and will inevitably accelerate inflation. A closer examination of inflation levels in Lebanon shows that in the last years (2008-2011), total inflation reached 17% most of which is attributed to the rising cost of transport, education, and health.

BOX 1: DECREE 7426/2012 – WAGES

The COM recently enacted a decree raising salaries for all employees by up to LL299,000 (\$199) per month, effective February 1, 2012. The increase was based on protracted negotiations and consensus among labor unions and trade organizations, facilitated by the Prime Minister's office. The final agreement was inked at the Presidential Palace on December

Economic interest groups therefore encourage the Government and trade unions to deemphasize wages and to focus instead on increasing the purchasing power. They argue that unless there is a concomitant increase in productivity, a unilateral increase in wages will accelerate inflation and ultimately reduce consumption. Like a domino effect, inflation will cascade down to other sectors like rent, health services, education, and the energy sector to name but a few. To afford higher wages, traders will have to: lower their profits, or sell fixed assets, or borrow more money, or lay off workers, or substitute Lebanese workers with foreign ones, and/or increase the price of their goods and services. None of these options is economically promising. These same interest groups warn that if their institutional savings go towards paying higher wages at the expense of new investment, economic growth in the country will slow down. This analysis resonates in the context of the national budget debate which has been paralyzed since 2005. The GOL has not invested in productive sectors since the last approved budget. In conclusion, economic interest groups demand greater focus on productivity and purchasing power. Labor unions demand higher wages and consumers argue that without adequate price control and consumer protection, wage increases will exacerbate the burden of living expenses on low and middle income households.

The following sections describe how the GOL is targeting specific social groups.

II.1 Children (age 0-15 years)

To protect this age group (0 to 18), Lebanon ratified the UNCRC in 1990. Lebanon signed the Optional Protocol (OP) to the CRC on the involvement of children in armed conflict in 2002 but has taken no action towards ratification despite the country's

history of armed conflicts and the presence of a significantly high number of refugee children. As for the OP on the sale of children, child prostitution and child pornography, Lebanon ratified it on 8 November, 2004. Lebanon is not party to the 1951 Refugee Convention and thus, the protection framework for refugee children is fragile. The Lebanese legislation is not yet in conformity with the CRC. There are gaps in the protection of refugee children, including Palestinian children. Inequalities in the right to a nationality persist especially in the case of Lebanese mothers married to a foreign father including Palestinian fathers who are non-IDs, Bedouins and migrant workers. In general, the absence of a unified civil personal status code contributes to discrimination against Lebanese citizens on religious grounds.

The GOL established in 1994 the Higher Council for Childhood (HCC) under the authority of the MOSA. The Council is a coordination body that seeks to implement the general principles of UNCRC and is active in reporting on the CRC, law reform, development of national action plans, raising awareness, as well as coordinating between various related ministries and civil society. In 1994, a parliamentary committee for women and children was established but Lebanon has yet to finalize a unified national action plan for children with a clear budget, and to mainstream in its legislative framework the principle of best interest of the child. National progress indicators are not entirely reliable and do not reflect the regional disparities or the status of different groups of children in Lebanon. Moreover, social protection and poverty alleviation programs are not universal (only certain categories of people benefit from these programs) and have major implications on children.

The vast majority of the 23,000 children placed in residential care institutions in Lebanon are not orphans but come from poor families that cannot support them, especially when it comes to providing them with education. The MOSA spends around 60% of its yearly budget (2005 values) on covering the cost of providing care to children in these institutions. Lebanon has yet to implement the international guidelines for the alternative care of children. Using violence against children for the purpose of disciplining is still legal under Article 186 of the Penal code which stated that "the law permits the types of discipline inflicted on children by their



parents and teachers as sanctioned by general custom”. Several studies show the widespread use of violence against boys and girls in all settings. The revised child protection law (Law 422/2002) is in place after combining efforts between MOSA/HCC and the parliamentary committee for women and children. The law has been submitted to the parliament and sent to related ministries for review and comments. Under this law, children will be able to communicate complaints to the judge about their experience of violence.

Enrolment in primary education is almost universal and roughly equal across genders (88%). Education is free and compulsory till age 12 but in practice many school-aged children are still out of school and dropout rates are high due to poor monitoring systems. The National Action Plan for Education aims to tackle the shortcomings in the quality of the education system. A national strategy for early childhood is lacking and intentions to raise the age for free compulsory education to 15 have yet to be translated into action.

In terms of child labor, statistics from the year 2000 show that 1.8% of children between 10 and 14 work. Lebanon ratified the International Labor Organization (ILO) Convention 138 and amended its laws in 1999 to prohibit the employment of children that are less than 16 years of age in hazardous conditions. A national committee for child labor was established as well as a specialized unit within the Ministry of Labor for combating child labor. Street children (of which 15% are Lebanese) are becoming a common sight in Beirut and other cities in the country. To mitigate this problem, the HCC developed in 2010 a national strategy for the prevention, protection, rehabilitation and integration of street children (yet to be approved). To protect juveniles and children outlaws, the GOL

raised the minimum age of criminal responsibility to 12 and separated juvenile girls from adults in detention centers. Efforts are needed to increase the institutional capacity to implement rehabilitation programs and educational alternative measures for juveniles as well as specialized training for police and judges. Alternative measures to incarceration are to be further explored based on pilot projects.

II.2 Youth (age 15-29 years)

This age group represents about 27% of Lebanon’s population. With a high literacy rate (98.7%, values for 2007) (Index Mundi, 2012) and the majority being bilingual or trilingual, youth in Lebanon attend public and private schools. However, the rate of school dropouts is high, motivated by family disputes and/or student’s personal problems. An estimated 44% of university students are enrolled in the Lebanese University (Lebanon’s only public university) and 56% enroll in any of the country’s 36 private universities (MOSA, 2011). The Lebanese University has 5 branches for each faculty. For example, there are 5 branches for the faculty of sciences in major cities including two main branches in the GBA (Fonar and Hadath), one in Tripoli (North Lebanon), one in Nabatiyeh (South Lebanon) and one in Zahlé (Bekaa Valley). Outside GBA, postgraduate diplomas are not available; therefore students, living in rural areas, will have to relocate or commute every day to the city in the absence of a good public transport network. Unemployment among university graduates in particular and youth in general is high (22.1% in 2007 – Index Mundi, 2012), an indication that jobs are scarce and that university programs do not match

market requirements. More should be done to synchronize university programs and the labor market; review the specialties offered and yearly capacities in response to changing labor demands; and provide career guidance and employment skills.

In terms of youth rights, several regulations discriminate young people aged 15 to 21 including the voting age, the nomination for Parliament election, and the right to establish and be a member of associations. These limitations discourage some youth in participating more actively in civil society. Amending these restrictions to become more inclusive is therefore important. In an effort to enhance young people's involvement and participation in governance, the GOL adopted, in April 2012, the First National Youth Policy for Lebanon to meet youth needs (health care and social services) and ambitions. Coordinated by the Ministry of Youth and Sports, the Youth Policy involves several ministries and would allow young people to start their own organizations and become involved in the political life. It will also help narrow the divide between the labor market and the education system, thus creating better employment opportunities for youth. There is an urgent need to coordinate efforts to assist youth who are vulnerable to risky behaviors such as drug and alcohol abuse, sexual assault and criminal activities. Several projects are underway by civil society organizations and NGOs in collaboration with line ministries to help youths at risk.

II.3 Adults (age 30-65 years)

Adults represent about 40% of the Lebanese population. A sizeable majority experienced war (1975-1990), decades of political instability (1990-present) and therefore grew up in a high-risk environment. Many adults dropped out of school at a young age and were enlisted by militias and other movements (nationalist, resistance, sectarian). The Civil War caused mass exodus of people (an estimated 25% of the population fled the country) many of whom did not return, and the displacement of many more. However, despite the regrettable effects of war and conflict on society, the Lebanese people who emerged from the Lebanese Civil War learned how

to compete, collaborate, compromise, and avoid trouble. Of importance is the fact that remittances from Lebanese abroad subsidize the national economy.

In an effort to help Lebanese citizens afford a home, and reverse youth migration and the resulting "brain drain", the MOSA raised in 2010 the value of housing loans granted by the Public Housing Institution (PHI). Applicants who wish to buy, build, or repair a home can now borrow LL270 Million (US\$ 180,000) at reduced interest rates, which is equivalent to a 50% increase. This decision was motivated by the rising cost of real estate and Central Bank fiscal policies. In 2010, a total of 6,192 loan agreements, equivalent to US\$ 500M, were administered by the PHI, providing housing support to around 6,192 Lebanese families. The PHI has provided up to 53,991 loan agreements to date (MOSA, 2011).

II.4 The Elderly

For a long time now, the GOL did not provide much attention to the elderly (8% of the Lebanese population). The functions of the National Permanent Committee for Elderly Affairs in Lebanon, chaired by the Minister of Social Affairs, have until recently been rather limited due to the lack of funding and the absence of laws specific to the protection of the elderly. The shortage in technical personnel, including doctors and private assistants who are specialized in dealing with the elderly issues is aggravating the already dire situation. MOSA is responsible for the well-being of old people through the Department of Family Affairs. This department collaborates since 2007 with the United Nations Population Fund (UNFPA) in Lebanon.

Separately, the Ministry of Public Health provides health care services (limited) to older people. In terms of nursing homes, a total of 160 institutions in Lebanon provide various forms and levels of support to the elderly. These institutions are distributed across the country but heavily concentrated in urban areas. Of these, 49 provide long-term in-patient care for around 4,181 residents. The majority of these institutions (97 %) are privately run and the rest are semi-private. They are managed

by civil society organizations with the support of the MOSA and the MOPH (CSA, 2012). Lebanon does not have currently a national pension policy.



II.5 Women

Maternal health has improved since 1993 with a decrease in maternal mortality from 140/100,000 live births in 1993 to 23/100,000 live births in 2009 (UNDP, 2010). Women represent almost half of the Lebanese population but only 21% are economically active mostly working in services, finance and insurance (CAS, 2009). Regional disparities prevail with regards to women's participation in the labor force; Beirut has the highest woman labor force while the Bekaa has the lowest (CAS, 2009). Traditionally, the role of women in the Arab World including Lebanon has been restricted to motherhood and home-maker. The participation of women in leadership positions and political life in Lebanon has been very limited. For example, women represent less than 4% of parliament's 128 seats. The Council of Ministers does not fare better. Two women were appointed ministers for the first time in 2004 but the current cabinet is exclusively men. The need to introduce a quota system for women in the new electoral law is urgently needed to increase women's participation in the political life.

Although Lebanese women enjoy a better status than other Arab women, several issues hinder their progress in the Lebanese society. For example, Lebanese women who are married to foreigners cannot pass their citizenship to their children.

The Lebanese citizenship is transmitted by law, only through the father, who has the right to pass the citizenship to his children and foreign wives. The absence of a unified civil code discriminates against Lebanese citizens on religious grounds. For example, the minimum age of marriage in Lebanon depends on the individual's religion and is different for boys and girls.

Gender is respected in the Lebanese Constitution and in many national policies. However, the need to articulate a national vision on how to improve the status of women in all aspects of society and to mainstream gender issues (declared in Lebanon's 1926 Constitution) in social development is urgent. Gender mainstreaming positions women and men at the heart of policy-making. It can also improve governance based on diversity and equity. An immediate step in this direction is to combat gender-based violence. In 1995, the GOL established the National Commission for Lebanese Women (NCLW) as the official national mechanism responsible for realizing women's advancement and gender equality in Lebanon. The commission developed a 10-Year National Strategy for Women and is currently being reviewed by the COM.

In 1996, Lebanon acceded to and ratified the United Nations Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) but has yet to sign the Optional Protocol which allows individual women, or groups of women, to submit claims of violations of rights protected under the Convention to the Committee (the body that monitors States parties' compliance with the Convention). A Women's Affairs Division at the Ministry of Social Affairs was established to monitor the implementation of the said UN Convention (and other Conventions) and formulate programs which respond to the needs of women by improving and strengthening their capacities (the Department proposes budgets to implement these programs). Local and regional NGOs are also promoting women's participation in public life and implementing awareness campaigns to counter stereotypical attitudes in the country. Recently, one of Lebanon's commercial banks launched the "WE" initiative to empower women to become social and economic entrepreneurs in the workplace and wider community and to facilitate their entry in the Global Banking Alliance for Women.

II.6 Persons with Disability

The Ministry of Social Affairs provides a wide range of support to persons with disability. Nationwide, MOSA has contracted about 72 institutions to provide learning and rehabilitation services to persons with disability (PWD) enrolled in or residing in these institutions. Until 2011, MOSA had issued 83,000 cards for PWD, providing certain benefits in education, employment, and health care. It should be noted however that the number of PWD in Lebanon is much higher as many are not registered at MOSA. In 2000, Parliament approved Law 220 stipulating some of the basic rights and services for PWD.

Unfortunately, to this date, many problems continue to restrict PWD access to basic services. For example, many PWD cannot access public education systems (public schools and the Lebanese University) because these facilities are not equipped to cater for PWDs. This results in higher illiteracy among PWD (especially in remote areas) leading to high unemployment. In the absence of social safety nets for PWDs, poverty becomes a pressing problem. Inadequate inter-agency coordination further limits the administration of PWD services. For example, when PWD become employees and obtain NSSF coverage, they no longer qualify for many services that were extended to them through the MOPH, which discourages PWD from formal employment. Furthermore, many institutions do not recognize the PWD card and require prior approval for every service. To be part of the labor force, there must be vocational rehabilitation programs for PWDs at the heart of the National Employment Office in Lebanon allowing them to re-enter the labor market.

With regard to employment, Law 220/2000 stipulates that at least 3% of job vacancies in the public sector should be set aside for PWD. To date, no serious action has been taken to encourage and enable employers to hire persons with disabilities and the GOL has not shown real commitment to achieving this target in the public sector (public and private working places are not adequately equipped to receive PWD). There is an urgent need for awareness-raising and training on

disability issues among employers at the national level. In an effort to integrate the PWD in the work force, the MOSA launched in 2011 the National Center for Supporting the Employment of PWDs in Lebanon, in collaboration with the Lebanese Physically Handicapped Union.

Globally, the UN Convention on the Rights of Persons with Disabilities was opened for signature in 2007. Lebanon signed this convention but has yet to ratify it. Therefore the primary goal for the Government of Lebanon is to ratify the Convention and its Optional Protocol to develop and implement policies, laws and administrative measures for securing the rights of PWD and abolish laws, regulations, customs and practices that favor discrimination.

II.7 Palestinian Refugees

The Palestinian presence in Lebanon dates back to the *Nakba* in 1948. Almost six decades later, Palestinian Refugees remain excluded from several aspects of social (they cannot form unions and associations), political and economic life in the country. According to a recent survey commissioned by the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA), of the 425,000 refugees registered with UNRWA since 1948, only 260,000-280,000 currently reside in Lebanon (AUB/UNRWA, 2010). More than half of the refugee population lives in camps (62%) and the rest (38%) live in gatherings, mainly in camp vicinity. There are 12 formal camps in Lebanon spread all over the country (Ain El Helwe, Beddawi, Burj Barajneh, Burj Shemali, Dbayeh, El Buss, Mar Elias, Mieh w Mieh, Nahr el Bared, Rashidieh, Shatila, and Wavel) and about 15 informal settlements.

Living conditions inside camps and gatherings are difficult to distressing. Within camps, UNRWA provides housing, water, electricity, health care and education (a network exceeding 100 schools and health care centers throughout the country). Notwithstanding the human dimension, Palestinian camps have encroached on natural areas that have no zoning and no environmental regulations.

The Palestinian refugee population is young (average age is 30 years) and women represent about 53%. The Palestinian refugee labor force totals 120,000 of which 53,000 are working. Survey results show that 8% of youth between 7 and 15 years were out of school and only 50% of youth between 16 and 18 years of age were enrolled in secondary schools (UNRWA/AUB, 2010). The GOL allows Palestinians to enrol in Lebanese public schools, institutes as well as the Lebanese University.

Lebanese legislation treats Palestinian refugees the same way it treats all other foreigners who reside and/or work in Lebanon (no special rights). Because Lebanese labor laws distinguish between Lebanese and non Lebanese workers, Palestinian Refugees residing in Lebanon should abide by the laws that govern the work of foreigners. Although Palestinian Refugees can work and benefit from the Lebanese social security, this benefit has been limited to the end-of-service indemnity as UNRWA is separately providing health care services. Until 2001, Palestinian Refugees had the right to own a land or an apartment but Decree-Law 269 (dated 3/4/2001) now prohibits Palestinian Refugees (but not other foreigners) to own property. This decree is causing hardships and tremendous complications related to inheritance between Palestinian refugees.

It is important to note that both the Palestinians and the Lebanese reject complete assimilation of refugees into the Lebanese State. This is mainly because assimilation conflicts with the Palestinians' UN sanctioned right of return. Until Palestinians are able to return to their homeland, the GOL should endorse the principles of refugee-citizenship, extending civil and economic rights to them.

II.8 Foreign Workers

Foreigners residing in Lebanon contribute to the development of the country. They are an integral part of Lebanese society, even though they do not hold Lebanese nationality nor enjoy the right to participate in political life as citizens. Foreigners are classified into two categories. The first category includes foreigners and their families residing on a permanent basis. These can be found in different regions and cities where they live and work under

similar conditions as the Lebanese population. The second category includes foreign workers who often live on construction sites, at work places or with their employers, in addition to Palestinian refugees inside camps.

It is difficult to estimate the number of foreign workers in Lebanon with precision. In 2009, the Ministry of Labor issued 46,000 new work permits for foreigners and about 100,000 permits were renewed (CAS 2009a). The actual number of foreign workers however is much higher since many workers operate without a work permit. Of importance, foreign workers registered in Lebanon can enjoy social security benefits provided their countries of origin offer equal treatment to Lebanese workers (i.e. France, Italy, UK, Syria, and Belgium). The 146,000 work permits include about 71,000 female (CAS 2009a) foreign domestic workers (almost 50%) who are excluded from the country's labor law and subject to restrictive immigration rules based on employer-specific sponsorship (numbers for male domestic workers are not available). The most common complaints documented by the embassies of labor-sending countries and civil society groups include mistreatment by recruiters, non-payment or delayed payment of wages, a refusal to provide any time off for the worker, forced labor, and verbal and physical abuse. Lebanon signed, in June 2011, the International Labor Organization's (ILO) Convention 189 on Decent Work for Domestic Workers. The convention, yet to be ratified, aims at offering domestic workers labor protection and monitoring of recruitment agencies. The GOL should consider ratifying ILO 189 Convention and amend the labor law to encompass foreign domestic workers.

II.9 Prisoners

Lebanese prisons operate at double their official capacity. Living conditions inside Lebanese prisons are notoriously bad and have led to grave human rights violations. There are 21 adult prisons in Lebanon harboring an estimated 15,000 prisoners (CAS Residents census, 2009). The most grievous offenses caused by overcrowding include inadequate access to natural light, insufficient exercise time, poor meal provisions, deplorable

sanitation, and chronic overcrowding where inmates are often left sharing beds or sleeping on the floor (Daily Star, 2011). Overcrowding has widely been blamed on the slow pace of the trial process and unsatisfactory legal aid, which is provided to all detainees on a pro-bono basis, but is in extremely short supply (the session can be delayed for three to four months). Poor medical care is also a major grievance, with most prisoners suffering from chronic illnesses including heart diseases or cancer, and failing to undergo consistent monitoring and care. Hospital visits are usually limited and only carried out in emergencies. Many inmates suffer from drug addiction and extreme physical side effects of withdrawal.

In an effort to improve this situation, Oum El Nour organization set up programs to guide, rehabilitate, accompany, and follow up on prisoners suffering from drug addiction. The Country Energy Efficiency and Renewable Energy Demonstration Project for the Recovery of Lebanon (CEDRO), a UNDP project funded by the Government of Spain through the Lebanon Recovery Fund, launched in 2011 a program to install Solar Water Heaters in Roumieh Prison (Mount Lebanon) to supply hot water to inmates. In addition to Lebanese prisoners, there are hundreds of foreigners detained for illegal entry or unauthorized stay. Foreigners are detained at the General Security Detention Center (located under the Adlieh Bridge in Beirut) awaiting deportation, but many are transferred to prisons and left there for long periods. At least 13% of prisoners are foreigners who have completed their sentences but have not been released yet, either due to inaction by their home embassies or bureaucratic delays in Lebanon.

Several legal modifications to ease the suffering of prisoners have been suggested including the immediate enactment of a draft law (drafted since 2002) that aims to reduce sentences for "good behavior." In March 2012 (10 years later), the Lebanese Parliament passed Law 216 (dated 31/03/2012) shortening the annual prison calendar from 12 to nine months (criminals with multiple convictions do not benefit from these provisions). In April 2012, the Ministry of Interior and Municipalities and a humanitarian organization

– Yes to Life – launched an initiative to improve the overcrowding situation in prisons across Lebanon by offering financial support to inmates who have served their sentences. As part of this initiative, private donors will offer LL100 million (\$66,000) to pay off the fines of 24 inmates (including foreign prisoners) who have served their sentences, but remain in jail. There are several other on-going initiatives to improve the living conditions for prisoners in Lebanese jails.

III. Environmental Sustainability

The GOL embraces environmental sustainability (MDG 7) as one of the pillars for sustainable growth in Lebanon. While the Government, aided by civil society organizations and the private sector, has made noteworthy strides towards enhancing environmental sustainability in the country, it also acknowledges that more can and should be done to safeguard the environment in Lebanon, protect the natural resource base, and enhance ecosystems services. Lebanon's ecological footprint (3 global ha/capita) exceeds the biocapacity (0.5 global ha/capita) of its environment which is unsustainable (AFED, 2012). See Lebanon's environmental performance index in Box 2. The following paragraphs describe the current state of environmental resources (water, air, biodiversity and land) while Section VI presents Lebanon's aspirations towards sustainable development in relation to seven critical issues (jobs, energy, cities, food, water, oceans, and disasters).

BOX 2 ENVIRONMENTAL PERFORMANCE INDEX

According to the University of Yale's 2012 Environmental Performance Index, Lebanon scored 47.35/100 and ranked 94 among 132 listed countries. The index is based on 25 performance indicators tracked across several policy categories covering environmental, public health and ecosystem vitality. <http://epi.yale.edu/epi2012/rankings>.

III.1 Water

Two-thirds of Lebanon's surface area is covered with Karstic formations characterized by springs, caves, and sinkholes. They make up a unique hydrogeological system resulting in aquifers that are highly productive but extremely vulnerable to water contamination. Lebanon's water sector faces great challenges including unsustainable water management practices, population growth, urbanization, and pollution. The long-term effects of climate change (potentially reduced precipitation and water availability) cannot be understated. Water demand in the country varies depending on source. Assumptions range from 1,473 to 1,530 million m³ per year (WB, 2009 & MOEW,



2010 respectively). Available water, defined as "present renewable resources per capita," is just over 1,100m³/capita/year, dangerously near the international benchmark of 1,000m³/capita/year. Falling below this benchmark would indicate water resources stress (WB, 2009). The GOL is fully aware that meeting the country's water demand over the medium and long-term poses a significant challenge to its work.

Although Lebanon is blessed with a favorable water regime (the country has the highest average annual rainfall of any country in the Middle East –661 mm/year –FAO, 2012), water supply is a serious problem almost everywhere in the country. It should be noted that Lebanon does not have the capacity to measure the volume of snow cover with any degree of confidence, but some institutions are conducting research related to snow cover and snowline. Total available water in Lebanon, including rivers and springs, storage dams and groundwater is estimated at 2,000-2,700 million m³ per year. This exceeds projected water demand of about 1,800 million m³ in 2035 but widespread pollution and substandard water infrastructure are restricting the Government's ability to meet water demand in the future. Irrigation is the largest water consumer in the country (61%) with low efficiency as open channels still constitute the majority of the networks (MOEW, 2010). Little is known about the quantity of water used by the industrial sector in Lebanon, but sources estimate that the industrial water demand ranges between 150 and 163 Mm³ per year, equivalent to around 11% of the total annual water demand (MOEW, 2010).

Almost 85% of buildings in 2004 were connected to water networks but at least 7% were also equipped with private water wells (CAS, 2006). However, intermittent supply and low consumer trust in city water has meant that residents pay 2-3 times the water tariffs in alternative sources of water. Excessive and uncontrolled groundwater pumping in coastal cities has led to seawater intrusion, often irreversible. Despite significant investment in the water distribution infrastructure, around 50% of the transmission and distribution pipelines still require special attention (leakages, corruptions, etc.) (MOEW, 2010). Consumer trust in public water supply is low and therefore the majority of households still rely on bottled drinking water (0.5% of GDP per year – WB, 2011a). Water rationing is very common all over Lebanon, especially during the summer months and leads to heavy reliance on bulk water tankers.

Wastewater generation from households (estimated at 249 Mm³/year – WB, 2011a) and industries (60 Mm³, MOEW, 2010) is affecting the quality of groundwater resources almost everywhere in Lebanon. Contamination occurs from raw sewage overflow, septic tanks and leaking sewer lines. Also according to CAS, only 52% of buildings in 2004 were connected to sewage networks coupled with significantly low treatment levels (4%). This means that at least 48% rely on septic tanks most of which are permeable or deliberately drained to prevent overflow. Nationwide, the highest rate of sewage connection was recorded in Beirut (96%), and the lowest was recorded in Batroun-North Lebanon (1%), followed by Bent Jbeyl-South Lebanon (4%). In the absence of industrial wastewater treatment plants, most industrial wastewater is discharged into the environment with little or no prior treatment, either directly into rivers and streams or through municipal wastewater networks.

Many river systems receive raw sewage resulting in dangerously high biological loads. The Litani River is probably the most publicized case of river pollution. Since 2000, the Ministries of Interior and Municipalities, Energy and Water and Environment as well as the Council for Development and Reconstruction have invested millions of dollars in solid waste management, wastewater treatment and land use management (agriculture) in and around the Litani river and watershed to prevent and reduce pollution of the Qaroun Lake (the river

estuary). Unfortunately, severe pollution problems persist today. In 2011, a business plan for combating pollution of the Qaraoun Lake was prepared by MOE-UNDP. The \$150 million business plan was presented to the Parliamentarian Committee for the Environment and discussions are underway to find sources of finance.

To protect and increase water resources (Principle 18 of Agenda 21), the Ministry of Energy and Water (MOEW) developed in 1999 a 10-Year Plan to build 17 dams and lakes across the country, which would capture approximately 650 Mm³ of water per year (Comair, 2010). Dams and lakes envisioned under the Plan were mainly for drinking water, and to a lesser extent irrigation. The 10-Year Plan was slated to be substantially completed by 2010. To date, only the Chabrouh Dam in the upper Kesrouan area (Mount Lebanon) was completed at the cost of approximately \$65 million for a 9 million m³ capacity. Despite technical challenges, budget overruns, construction delays, and now growing evidence of leaks (which even if unplanned help replenish aquifers), the dam represents today a much-needed water reservoir for the upper Kesrouan region and should serve as a case study for future dam projects in the country. Very little progress has been made towards building the remaining 16 dams. However, in 2010, the MOEW developed a National Water Sector Strategy to revamp the water sector in the country (described in Section VI under aspirations in the water sector).

III.2 Air and Atmosphere

The GOL is alarmed by the environmental cost of air pollution in Lebanon, about \$170 million per year (WB, 2011a). The impact of air pollution on public health and the economy cannot be underestimated. Ambient air in Lebanon is affected by several anthropogenic activities such as transport, energy industries, manufacturing processes as well as agriculture, quarries, construction activities, and open burning. Air quality is also affected by natural phenomena including forest fires, dust storms and climatic conditions. The transport sector is the main source of urban air pollution in the country (MOE/EU/NEAP, 2005u). It is one of the largest contributors to urban air quality deterioration

accounting for 59% of national NOx emissions in 2005 (MOE/GEF/UNDP, 2010u).

Since the introduction of unleaded gasoline in Lebanon in 1993 and the ban on leaded gasoline in 2001 (Law 341/2001), total lead emissions have dropped sharply. In 2001, the GOL also banned Diesel oil in vehicles (not to be confused with Diesel oil in Europe with physical and chemical properties described under EN 590). While this measure reduced Diesel emissions from vehicles, the ban did not extend to trucks and buses as they continue to run on Diesel oil without proper inspection of fuel quality and exhaust emissions, polluting much more than gasoline (PM, soot, NOx and CO). Accordingly, the 1995 emission standards for trucks, buses and motor vehicles (Decree 6603/1995) must be revised.

In the absence of a well-functioning public transport system, the Lebanese population is exceptionally car-dependent. The current fleet size of about 1.2 million vehicles (one vehicle to every four people) is choking roads and sidewalks in all major cities. The government has invested considerable resources in expanding the road sector but the impact of a more extensive road network was effectively neutralized by the influx of new vehicles (annual vehicle registration increased from 40,515 in 2001 to 106,959 in 2008). The Government has fallen in the trap of building more roads to accommodate more cars. It has failed in articulating a national vision for public transport and/or mobilizing the required resources to implement the vision. Government spending on public transport has been trivial compared to road spending.

Lebanon's energy industries (7 thermal power plants) degrade air quality, emit large smoke plumes and contributed 39% of the country's CO₂ emissions in 2005 (MOE/GEF/UNDP, 2010u). The aging Jiyeh (South Lebanon) and Zouk (Mount Lebanon) power plants, built in 1970 and 1985 respectively, burn heavy fuel oil, a dirty fuel. The informal sector is another major contributor to air pollution in cities; private back-up generators produce an estimated 500MW of electricity, about 20% of total production, causing tremendous nuisance in cities such as noise, heat and exhaust (MOEW, 2010). Industries, so widely spread across the Lebanese territory, also impact air quality. The majority are located outside so-called "industrial zones" and inside or near residential areas. Effective zoning

regulations for industries are either lacking or are not enforced. Of Lebanon's estimated 4,033 "large establishments,"² about half are located in Mount Lebanon and 18% in the Bekaa region. Lebanon's First National Communication to the UNFCCC documented the contribution of several industrial sectors to total air pollution in Lebanon. For example, NMVOC emissions are mainly produced during road asphaltting; the production of sulfuric acid is the biggest source of SO₂; iron and steel mills are the major source of CO emissions; and the cement industry is the greatest producer of CO₂ among industries (MOE/GEF/UNDP, 2002).

In the last decade, Lebanon has made noticeable progress in monitoring air quality. A Preliminary Air Quality Monitoring Program was established in 2003 by Saint Joseph University and the Beirut Municipality using 23 monitoring stations for sampling and analyzing key air pollutants in Beirut. The program was then expanded in 2008 to cover the Greater Beirut Area (GBA) with the participation of the American University of Beirut. Outside GBA, the Tripoli Environment and Development Observatory and the University of Balamand are involved in air quality monitoring. In particular, the observatory started to measure and monitor TSP and PM in 2000 in the region of Al Fayhaa. The University started in 2008 to monitor TSP in the industrial area of Chekaa and Selaata (North Lebanon). Data series confirm that while SO₂ levels in Beirut are acceptable, NO₂ and PM values exceed the corresponding WHO annual standards and guidelines respectively. In Tripoli, PM values exceed WHO annual standards by far. Municipalities and universities have started to acquire air quality monitoring instruments and train air quality professionals. Air quality capabilities should be expanded to other parts of the country including the Bekaa Valley and South Lebanon (air quality improvement programs are described in Section VI).

To protect the atmosphere (Principle 9 of Agenda 21), MOE and UNDP established in January 1998 the National Ozone Unit (NOU) to meet its obligation under the Montreal Protocol on Substances that Deplete the Ozone Layer. Lebanon has since entered into a \$14.3 million agreement with the Multilateral Fund (MLF) for the phase-out of all Ozone Depleting Substances (CFCs, Annex-A, Group-I Substances, Methyl Bromide, Annex E Group-I Substances).

²(i) workforce with a minimum of 5 workers, (ii) at least 100m² of surface area, and (iii) energy consumption with a minimum of 50 Amperes or equivalent

To achieve the 2010 milestone, the NOU provided technical and financial assistance to approximately 100 industries (foam, aerosol and refrigeration sectors) in the country, helping them to convert their production from ODSs to non-ODSs technology. During the period 1998-2010, Lebanon reduced consumption of CFCs from 923 tons in 1993 to zero consumption in 2010. Phasing out CFCs did not completely solve the entire ozone depletion problem. While CFC consumption declined, the reliance on alternatives, including Hydrochlorofluorocarbons (HCFC) with a high global warming effect, increased threefold from about 278 MT in 2004 to 826 MT in 2009. The MLF will provide \$2.5 million to help Lebanon prepare an HCFC Phase-Out Management Plan to reduce consumption of HCFCs by 10% by January 2015 (NOU, 2012).

With regard to combating climate change, Lebanon is signatory of the United Nations Framework Convention on Climate Change (UNFCCC) and reports to the Conference of the Parties (COP) national inventories of Greenhouse Gases (GHGs). Since 1994 (date the convention was ratified) Lebanon has submitted two inventories for baseline years 1994 and 2000 including an assessment of the country's vulnerability to climate change and several adaptation and mitigation strategies to reduce GHG emissions. Lebanon has no obligation under the Convention to reduce its GHG emissions. However, Lebanon has voluntarily committed to increasing Renewable Energy (RE) shares to 12% by 2020 (Lebanon's vision for energy sustainability is described in Section VI).

III.3 Biodiversity

Terrestrial Biodiversity

The cost of environmental degradation in Lebanon linked to land and wildlife resources is estimated at \$100 million per year, or 0.6% of Lebanon's GDP (WB, 2011a). Lebanon's geomorphology harbors immense biological diversity that must be carried over to future generations. Although biodiversity and forests provide invaluable ecosystem services and support countless jobs, either directly or indirectly, human activities are rapidly degrading

this resources base (illegal hunting, over-fishing, overgrazing, wood cutting, agriculture expansion, urban encroachment, etc.). Additionally, Lebanon is witnessing the introduction of invasive non-native plant and animal species. The same is true for agricultural species and genetically modified organisms (GMOs), such as food products, which find their way into the country without adequate control or monitoring.

Recognizing the value of biodiversity to society and the perils of biodiversity degradation, the GOL signed the Convention on Biological Diversity (CBD) in 1992, ratified it in 1994 (Law No. 360/94) and has since taken noteworthy steps to promote flora and fauna conservation. Supported by Lebanon's vibrant research community, the Ministry of Agriculture conducted a national assessment of Lebanon's biological diversity in 1996 (Principle 15 of Agenda 21). The Ministry of Environment has also produced four national biodiversity reports to the CBD (1998, 2003, 2006 and 2009). The GOL signed and ratified several other conventions related to biodiversity conservation and genetic resources including:

- Protocol concerning Mediterranean Specially Protected Areas (1994)
- United Nations Convention to Combat Desertification (1995)
- RAMSAR Convention on Wetlands of International Importance (1999)
- African Eurasian Water Bird Agreement (2002)
- Cartagena Protocol on Biosafety (2008)

Lebanon has also started procedures to sign the Nagoya Protocol on Access and Benefit Sharing, adopted by the COP in October 2010. Of the remaining conventions and treaties that Lebanon should sign, ratify and implement are the Convention on International Trade in Endangered Species, CITES (W/DC, 1973) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979). Lebanon has started procedures for CITES accession.

In terms of forests, Lebanon's forest landscape continues to undergo significant transformations and losses primarily due to habitat fragmentation, unplanned urban expansion leading to soil erosion, diseases and dieback, forest fires, wood harvesting for home-heating and/or charcoal production, and



illegal quarrying. In 2010, forests covered 137,000 ha (13% of the territory) and Other Wooded Lands covered 106,000 ha (10% of the territory). Although MOA has lead responsibility for setting up a national program for forest management and reforestation (1949 Forest Law), the Lebanese parliament approved Law 326/2001 mandating MOE to design and implement a National Reforestation Plan (NRP) using indigenous forest species and private sector contractors.

To combat deforestation (Principle 11 of Agenda 21), Lebanon has initiated and is implementing a number of programs to restore forests including the National Action Plan to Combat Desertification (MOA/GIZ/UNDP, 2003-2010), the National Reforestation Plan (MOE, 2002-Present), Safeguarding and Restoring Lebanon's Woodland Resources (MOE/GEF/UNDP, 2008-2013), and the Lebanon Reforestation Initiative (USFS, 2010). Meanwhile, the NGO community is also spearheading dozens of reforestation campaigns and programs across the country amounting to millions of dollars.

Attempts to integrate these dispersed initiatives into a national campaign have not been successful thus far. The continued lack of coordination in data sharing and management is limiting the impact of government programs and NGOs initiatives in reforestation. Therefore, the net impact of all of these programs on national forest cover and ecosystem health is difficult to assess and should be measured against the concomitant rate of forest loss. Consequently, Lebanon (MOE, MOA and specialized NGOs) needs to develop a National Strategy for the Protection and Management of Forests.

Forest fires are consuming forests at a rate that is faster than all reforestation initiatives combined. There were 280 recorded forest fires in 2009 affecting 2,642ha, up from 129 fires in 2004 affecting 586ha. A number of fire prevention and fire-fighting initiatives were launched since 2005 including the preparation of a Fire Risk Map to predict forest fire-prone areas. Following the devastating fires of 2007 and 2008, several ministries (Environment, Agriculture, Interior and Municipalities - Civil Defense, Defense - the Lebanese Army) and the AFDC produced Lebanon's National Strategy for Forest Fire Management. Equally important, the Lebanese Parliament approved Law 92/2010 banning the use of burnt forest areas in an effort to deter arsonists.

Since 1992, Lebanon has designated 14 protected areas (PAs) covering 2.5% of the territory. MOE is the lead government agency responsible for protected area management in Lebanon (Article 23 of Law 690/2005). Additionally, Lebanon boasts three biosphere reserves (4% of the territory), 13 protected forests, 16 protected natural sites/landscapes, four Ramsar sites, five World Heritage Sites and at least 15 Important Bird Areas. Although Lebanon has an impressive repertoire of protected areas and sites, criteria for PA designation and management remained vague until recently. Building on the work of the GEF-funded Biodiversity Protected Areas project (1996-2002), a framework law on nature reserves was drafted and recently approved by the COM (January 2012). In addition to the 152 forest guards (mostly underpaid and underequipped), operating from 31 forest stations, the framework law will create many new jobs in the PA conservation and management.

Marine Biodiversity

More than 70% of Lebanon's population lives in the coastal zone. The impact of population density and economic activities on marine biodiversity is therefore immense and pose formidable challenges to coastal zone management, including the conservation of marine resources, and the protection of sea-based livelihoods and the Mediterranean Sea. The marine environment has been marginalized for decades and was often managed like an expendable resource. For example, the coastal cities of Tripoli, Beirut-Borj Hammoud and Saida maintain large-scale seafront dumpsites. Short of sufficient inland space, the Government has built expensive facilities that infringe on the public maritime domain and/or protrude into the sea, including wastewater treatment plants, highways, and sports stadiums. The private sector has also implemented oversized sea-filling projects for real estate development.

These practices are not sustainable and have immeasurable and irreversible impacts on marine biodiversity and coastal habitats such as altering wave patterns, preventing sand replenishment, and reducing public access. Other investors have built semi-permanent beach resorts that block public access to the sea, often in collusion with municipalities who charge a rental fee. Lastly, the marine environment is also a depository for untreated wastewater from cities and industries. Illegal sand removal, widespread in the 1990s, has altered the sea floor and has accelerated coastal erosion in several coastline areas. Protection measures, either for species or ecosystems, are still negligible in Lebanon.

In an effort to control malpractices by the fishing industry, the Ministry of Agriculture has (1) banned dynamite fishing and trawling nets, as well as fishing of marine turtles, cetaceans and monk seals (Decision 125/1, 1999), (2) banned the use of small mesh sizes (Decision 408/1, 2007), and (3) regulated the scuba-diving industry including permitting procedures and safety measures (Decision 93/1, 2008). The ministry has also banned the use of spear fishing by scuba divers as well as the sale and trading of any of its derivatives. MOA's ability to enforce these bans and fishing restrictions is very limited due to the lack of the human resources and boats needed to patrol fishing waters.

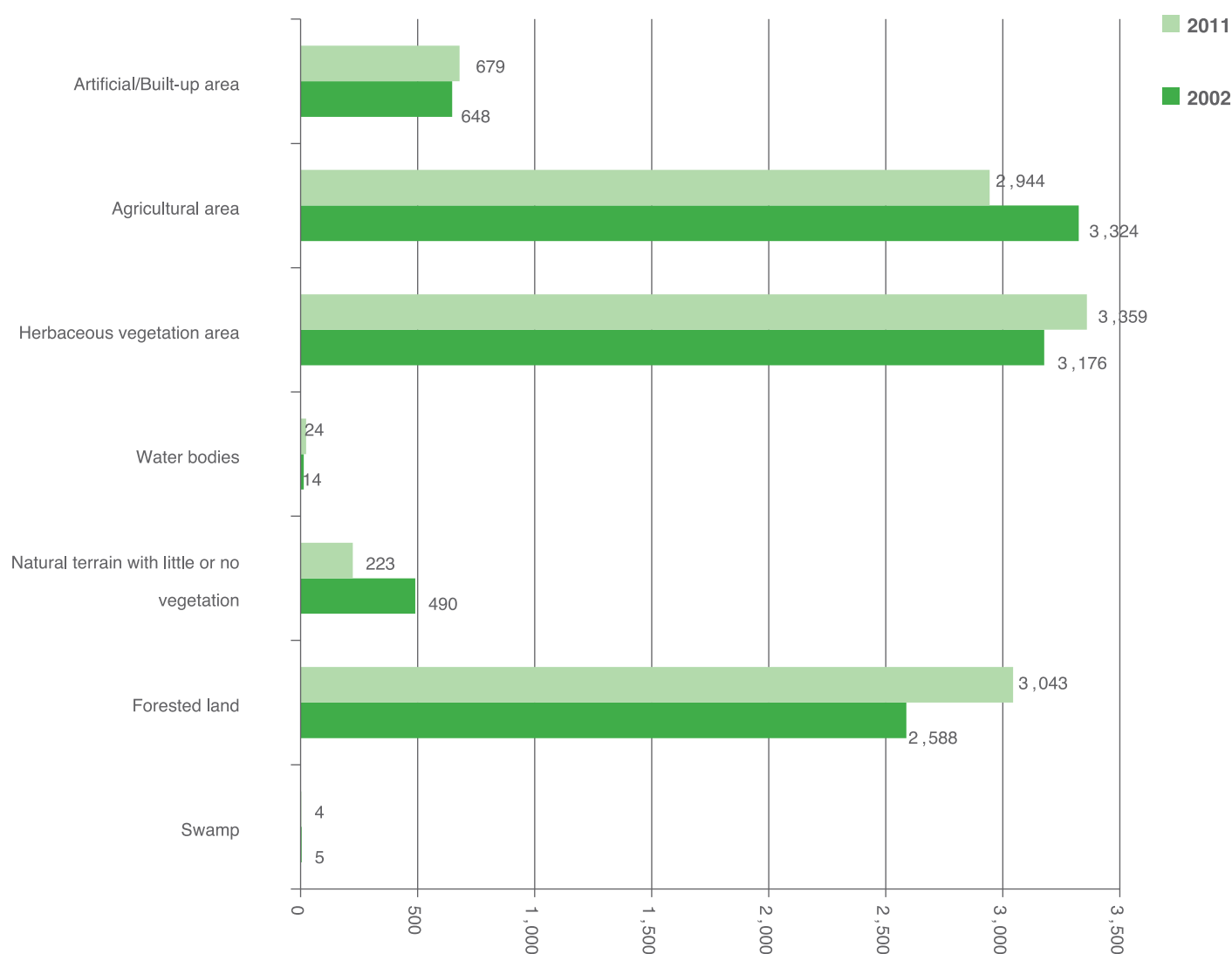
The freshwater environment is also an important resource for Lebanon. With grant funding from Fonds Français pour l'Environnement Mondial/UNDP, MOE implemented a project for the Conservation of Wetlands and Coastal Zones in the Mediterranean (MedWet Coast Project) –a Mediterranean initiative under the Ramsar Convention (2002-2006). The project addressed biodiversity conservation issues in the Tyre Coast Nature Reserve (South Lebanon) and Ammiq wetland (Bekaa Valley). Specifically, the project assessed the carrying capacity of the Tyre reserve to guide the municipality of Tyre on how to manage the public beach while ensuring the protection of the endangered Mediterranean marine turtles. The assessment led the municipality to reduce the number of kiosks from 100 to 50 (they receive thousands of tourists and beachgoers in summer) and push these kiosks back 60m from the wave level during high tide. These measures are expected to increase the occurrence of marine turtle nesting and hatching in the area.

III.4 Land

Lebanon is a small country (10,500km²) with a high population density (about 400 inhabitants/km²). Land use planning is paramount to sustainable growth and development. Unfortunately, the lack of urban planning and/or inadequate urban planning regulations has facilitated urban sprawl at the expense of natural landscapes and living conditions. Construction is consuming agricultural lands, roads and highways are infringing on scenic mountain landscapes, and real estate speculation is changing the social fabric of some communities and villages.

Lebanon's quarry sector and aggregate industry have also altered land forms, in some cases beyond recognition, and with minimal government control. Although it is difficult to survey with precision all quarries, a recent study counted 1,278 quarries covering 5,267 ha scattered all over the country (Darwish et al., 2010). These quarries scar the Lebanese landscape, and the vast majority remain unlicensed. The chaotic state of the quarry sector has many root causes including rising demand for construction aggregates, the lack of accountability,

Figure 2 – Lebanon’s Land Cover & Land Use (2002 and 2011)



Source: MOE/NCSR, 2002 (published) and NCSR, 2011 (unpublished)

Area in km²

delays in promulgating the long-awaited quarry master plan, and large scale infrastructure projects including sea filling. It can also be argued that for a small country the size of Lebanon, the occurrence of five cement plants has a perverse effect on the construction sector and on GOL infrastructure plans. Current land management practices in Lebanon are therefore unfitting as they continue to erode the country’s natural resource base and landscapes. Land cover and land use data for Lebanon in 2011 show that almost 7% of the territory is urbanized and that agricultural areas contracted by almost 10% in the last decade (see figure 2).

Like the rest of the world, Lebanon is urbanizing (Urbanization rate in 2005 was 88%). For the last

20 years, urban (and rural) master plans remained rudimentary in the country; they were primarily concentrated along the coastal zone and large agglomerations. An estimated 84% of Lebanon has no master plans yet. Unplanned areas are administered and managed by blanket regulations that rely on two factors: lot coverage and floor-area-ratio. Therefore, master plans are frequently inadequate and fuzzy, dealing with zoning only from the perspective of permissible built-up area and total allowable height. Existing master plans are rarely conceived holistically and often fail to include the necessary environmental, social and economic structures of communities.

To promote sustainable land management (Principle 10 of Agenda 21), the Council of

Ministers asked CDR in 2001 to prepare a National Land Use Master Plan for Lebanon. The National Master Plan describes the physical attributes impacting land use, future challenges, alternative configurations for land use and development, and presents sectoral action plans (transport, tourism, energy, water, environment, education, etc.). In particular, the plan proposes a unified set of land use categories covering the entire territory, and delineates several protection zones of ecological and patrimonial importance at the national level. The final analysis was published in 2004 but the COM approved the National Master Plan only five years later (Decree 2366/2009).

The Government's endorsement of the master plan marks an important juncture in Lebanese land use planning. Unfortunately, the decree will not significantly alter land use planning in the country unless and until the GOL makes a conscientious and sustained effort to introduce the plan in regional urban planning regulations and employs the master plan to guide social development strategies and related investment. The Higher Council and the Directorate General of Urban Planning must mainstream the National Land Use Master Plan in all of its dealings and in full concert with local municipalities.

Recognizing the unsustainable path of development in the coastal zone, the CDR conducted in 1997 an environmental assessment of the coastal zone of Lebanon, as a prelude to a nationwide Integrated Coastal Zone Management plan. The assessment was completed but the follow-on ICZM plan never materialized due to a funding shortage and the absence of political will. In 2001-2003, the MOE implemented the "Coastal Area Management Programme" to introduce Integrated Coastal Area Management (ICAM) as the basic tool to achieve sustainable development at three municipalities in South Lebanon.

Regionally, an ICZM was conducted between Jbeil (Lebanon) and Latakia (Syria) (2000-2002).

More recently, the University of Balamand (Institute of the Environment) initiated in 2007 a coastal zone management program in north Lebanon (about 80

km; 37% of the total Lebanese coast) as part of a regional project entitled Integrated Management of East Mediterranean Coastlines (IMAC). Funded by the European Commission, the program in north Lebanon has so far investigated the environmental, social and economic status of the Mohafaza of North Lebanon and set management approaches for its coastal zone. More recently, the Government of Greece contributed \$1.64 million to improve Lebanon's environmental monitoring capabilities in the areas of air quality and the marine environment. The program will build on the experience and work of the University of Balamand – see section VI for more details on the National Integrated Coastal Zone Management plan.

IV. Green Economy

Lebanon has started to mainstream environmental consideration in its economic systems. While a greener economy is important to sustainable development and to alleviating poverty, the impact of a greener economy on local and global financial systems remains ludicrously small and insignificant. The global discourse on the green economy, so far, does not tackle the development paradigm and the prevailing economic model.

Lebanon recognizes the need to promote a public debate on what constitutes a green economy and how to achieve it (ESCWA/UNEP/LAS, 2011). Many stakeholders believe that we should jump the green economy band-wagon but have yet to agree on what constitutes a green economy and how it helps meet sustainable development goals. Lebanese civil society organizations contend that while *green* is good, economic growth should not be based on color but on whether growth embraces the fundamental principles of sustainable development including equity.

Below are some illustrative examples of how green economy initiatives (tariffs on environmental goods and services, sustainable public procurement, green financing, green jobs) are evolving in Lebanon in response to the green economy momentum and the need to pursue a more sustainable growth pattern.

BOX 3 CONTEXTUALIZING THE GREEN ECONOMY

While reference definitions should be based on global forums, it is through inter-ministerial coordination and public-private sector dialogue that Lebanon should establish a vision for growth that embraces the principles of a greener economy as one of its pillars.

IV.1 Environmental Goods and Services

The Ministry of Economy and Trade (MOET) conducted a comprehensive tariff review of all environmental goods and services for which

Lebanon is a net importer. The Ministry found that total import of environmental goods and services into Lebanon represent approximately 2.1% of total import activity and that out of a list of 160 potential goods and services, more than 93% of them have tariff rates equal to or less than 5%. In economic terms, this is an excellent tariff structure for facilitating the flow of green goods and services (though not the result of any formal policy). The simple average tariff rate for all environmental goods and services is 4.4% though certain select items fare less, with tariff rates being as high as 20%. Such high rates should be reduced.

Despite a favorable tariff structure, the GOL should strive to promote national research and development in the design and manufacturing of environmental goods (and other goods using the Sustainable Enterprise Model). Overwhelming reliance on imported environmental goods and services is not a sustainable path and should therefore be mitigated through national innovation and the provision of an enabling environment for research and development (R&D).

IV.2 Sustainable Public Procurement

Like all governments, the GOL is a major spender, and consumer of goods and services. The government's purchasing power represents 15 to 25% of GDP. The GOL represent an important agent for change and has a duty to lead by example and make responsible decisions in relation to public procurement that in turn create a better and safer world.

In December 2008, the Swiss government and UNEP established a partnership to implement the Marrakech Task Force³ approach on Sustainable Public Procurement (SPP) in both developed and developing countries. Lebanon, along with seven other countries, is participating in the pilot project Capacity building for Sustainable Public Procurement in developing countries, implemented by UNEP. Under this project and in 2011, the Basil Fleihan Institute of Finance conducted a market

³ The Marrakech Process is a global process to support the elaboration of a 10-Year Framework of Programs (10YFP) on sustainable consumption and production.

assessment on the status of sustainable public procurement in Lebanon, based on which the following six priority areas for public procurement were identified:

1. Regional disparities minimization
2. Renewable energy promotion
3. Transport and traffic sector improvement
4. Water management (production and home servicing)
5. Waste management (hazardous/non hazardous)
6. Coastal areas preservation

The assessment also identified legal gaps in promoting sustainable public procurement and presented recommendations on how the GOL could play a leading role in expanding the local market for sustainable procurement. Proposed actions include encouraging R&D, offering subsidies to the organic farming sector, and reducing taxes on sustainable products. To move forward, the Government must streamline sustainable procurement practices when it procures goods and services; from stationeries and vehicles, to public infrastructure works such as schools, roads and renewable energy projects.

IV.3 Green Financing

The Ministry of Finance (MOF), through Banque du Liban (BDL), introduced in 2001 a subsidized interest loan to support investment in three key economic sectors (industry, agriculture and tourism) –BDL Circular 7743/2001. In June of 2009, BDL also introduced a new policy to facilitate loans for environmentally-friendly projects (new projects as well as retrofits) –BDL Circular 197/2009. In November 2010, the BDL further introduced new loan incentives to finance environmental projects in energy (renewable energy, energy efficiency, and green buildings) and non-energy –BDL Circular 236/2010.

The underlying pillars of BDL's policy to support green projects are longer loan maturity, lower interest rates, and no ceiling on loan amounts. Additionally, BDL is preparing a €12M project with the EU to provide bonuses to energy projects. Kafalat will soon launch "Kafalat Energy" to encourage energy projects. BDL initiatives could be further enriched/

strengthened with the mobilization of new lines of funding, from existing facilities or new ones, such as the planned Arab Environment Facility.

In an effort to reduce pollution from the industrial sector, the German International Cooperation (GIZ), under the Environment Fund for Lebanon (EFL), is currently assisting eight industries in Kesrouan (Mount Lebanon), the Litani Basin and North Lebanon in implementing wastewater treatment plants for industrial wastewater. Additionally, MOE will soon launch the *Lebanon Pollution Abatement Project* (LEPAP) in coordination with MOF and BDL. The project will (1) assist industrial enterprises in conducting environmental audits and selecting the best available technologies for reducing pollution and (2) set up a finance scheme whereby industries will be able to apply for and receive sub-loans from commercial banks at prevailing market rates but with a grant portion that will be disbursed after the applicant has reached a preset pollution abatement goal. LEPAP will be piloted using a \$15 million loan from the World Bank and possibly an additional loan at favorable rates from the international donor community (Italian Government) in the range of \$15-20 million. The MOF will pay back these loans to international financiers at no extra cost to the Treasury. The proposed LEPAP will complement and leverage on-going green initiatives by BDL and Kafalat.

IV.4 Green Jobs

The traditional business model "grow first, clean up later" is unsustainable. Green jobs offer a win-win solution by reconciling poverty reduction and environmental sustainability goals (MDG Goals 1 (poverty eradication) and 7 (environmental sustainability) becoming mutually supportive rather than conflicting). It is important to note however that not all green jobs are new jobs and that Lebanon has for centuries offered jobs that restore environmental quality mostly in agriculture (bench terracing), reforestation (Green Plan) and manufacturing (handicraft). Green jobs should not favor technology-based jobs at the expense of traditional and more labor-intensive jobs.

BOX 4 WHAT ARE GREEN JOBS?

According to UNEP, a green job is “work in agricultural, manufacturing, research and development, administrative, and service activities that contribute(s) substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity; reduce energy, materials, and water consumption through high efficiency strategies; de-carbonize the economy; and minimize or altogether avoid generation of all forms of waste and pollution.”



A 2010 preliminary assessment of potential green jobs in Lebanon examined four key job sectors: energy, construction, agriculture/forestry and waste management (ILO/UNDP, 2010).

The study assessed Lebanon’s current and projected employment potential in those sectors as the country gradually shifts towards a greener economy, as summarized in Table 1.

Table 1 Current and Projected Green Jobs in Lebanon Across Four Sectors

Sector	Description	Projections
Energy	<p>Current number of green jobs is >500 (excl. transport sector). The Policy Paper for the Electricity Sector prepared by MOEW will positively impact the green jobs market. Investment in RE and EE sectors will create jobs in energy management and auditing systems, concentrated solar power, wind energy, photovoltaics, and SWH (construction, installation, O&M). Unfortunately, Lebanon is not manufacturing EE appliances and so far is not benefiting from this green job market. Lebanon also lacks vocational training in niche RE and EE technologies (AUB launched a graduate program in RE & EE) which is crucial to jumpstart the RE and EE revolution. To accelerate the investment in RE, Lebanon should phase out fossil fuel subsidies and introduce tax reforms that will internalize external costs of highly polluting technologies.</p>	<p>4,000 green energy jobs by 2020 based on the 12% RE pledge and 1,050,000m² of installed solar water heaters.</p>
Construction	<p>The construction boom (accelerated by the global credit crunch and the transfer to funds from the Arab Gulf states) and increased awareness among several contracting companies of the benefits of building green present real opportunities for creating many green jobs. In Lebanon, it is estimated that \$1million of investment in green buildings will create 45 jobs per year. Barriers to wider pursuit of green buildings in Lebanon include the lack of government regulations on green standards and verification, and the higher costs of building green.</p>	<p>900 new green jobs per year based on BDL estimate that \$100M will be invested in green buildings over the next 5 years.</p>
Waste Management	<p>Moving towards Integrated Solid Waste Management requires Lebanon to move upstream in the waste management hierarchy, towards more environmentally sustainable options (less landfilling and incineration and more waste recovery and minimization). Green jobs in waste management are defined as jobs providing decent work that seek to decrease waste loads and the use of virgin resources through reuse, recycling and recovery. The current number of green jobs in waste management is about 3,400 (waste collection, sorting, composting, recycling and sanitary landfilling), hazardous waste management (medical waste treatment) and wastewater treatment (sanitation and WWTP).</p>	<p>1,900-2,500 new green jobs are expected if current plans for waste management sector are followed through over the coming decade. Waste-to-energy systems and closure and rehabilitation of open dumps would create an additional 640 permanent jobs and 400 temporary jobs.</p>
Agriculture & Forestry	<p>The number of green jobs in both Integrated Pest Management and organic agriculture is about 700. While reforestation activities are underway in many parts of the country, these initiatives remain fragmented and have not yet succeeded in scaling up. Green jobs are also linked to fire protection, forests guards, protected areas and forest management. An important subsector, eco-tourism, also presents opportunities for green jobs.</p>	<p>1,600 jobs by 2020 assuming a linear trend in organic production. 15,000 jobs in the forestry sector by 2020 if the GOL's National Reforestation Plan (spearheaded by MOE) is fully implemented.</p>

Source: ILO and UNDP, 2010

In addition to the energy, construction, waste and agricultural sectors, Lebanon should identify and promote green jobs in other sectors. For example, the institutionalization of environmental prosecutors (recently approved by the COM) and the environmental police (still in proposal stage), as well as direct employment by the Ministry of Environment and environmental institutions, will generate upwards of 1,000 permanent jobs in Lebanon's environmental sector.

Another important platform for green jobs in the country is sustainable tourism and protected areas. Despite significant urban pressure, ecotourism is a burgeoning subsector in Lebanon. In particular, the Al Shouf Cedars Nature Reserve and Biosphere Reserve has established itself as a premier ecotourism destination in Lebanon, generating jobs and expanding rural income in buffer areas. Cited by the *Arab Environment 4 Green Economy* as an international model for ecotourism, the Lebanon Mountain Trail (LMT) is another example of sustainable tourism with unlimited capacity to create green jobs and jumpstart the green economy along its 440km trail corridor benefiting 70 towns and villages while respecting local traditions. More generally, the number of businesses and organizations offering outdoor recreation including hiking and outdoor adventure is further indication of the rising demand for nature-based tourism.

In conclusion, Lebanon appreciates the merits of a greener economy and is facilitating the debate forward, partly through the work of the Beirut-based Arab Forum for Environment and Development (AFED). However, Lebanon's timid strides towards a greener economy should be evaluated in the context of its GDP growth and composition, and its commitment to fiscal reform policies (including the national debt burden and corruption). Civil society contests strongly the current model of the growth-led economy and advocates a national debate to identify the real economic challenges based in the model. These challenges pertain to how the GOL can revitalize productive sectors, redistribute wealth, introduce fair tax schemes, and provide basic services to all without prejudice. Incidentally, a review of GDP growth in Lebanon since 2002 shows a strong annual growth (7% in 2010, against 9% in 2009, 8.6% in 2008; 8.4% in 2007; 0.7% on average in 2005 and 2006; 7.5%

in 2004; and 2.5% on average during the period 1997-2003). The largest contributing sectors were construction, services, and industry. So long as construction remains the main economic driver for growth in Lebanon, no matter how green it is, then the impact of a green economy on Lebanese society remains insignificant.



V. Environmental Governance

The GOL and civil society organizations recognize the overriding need to promote and strengthen environmental governance in Lebanon. Governance as usual is not an option. The following sections describe how environmental legislation, institutions and enforcement in relation can help improve environmental governance in the country.

millions of dollars in international aid and technical assistance. Universities and technical training institutions should offer courses related to MEAs so that the next generation of environmental graduates, as well lawyers and judges understand the legal provisions and Lebanon's obligations related to each agreement.



V.1 Environmental Legislation

During the first decade after the 1992 Earth Summit, Lebanon had very scant environmental legislation but was able to regulate certain environmental problems through ministerial decisions. In the period since 2002 however, Lebanon has seen a qualitative and quantitative leap in environmental laws and regulations, including the ratification of all major Multilateral Environmental Agreements (MEAs). In particular, Lebanon has acceded to and/or ratified more than a dozen conventions and treaties related to the environment (CBD, UNFCCC, UNCCD, Stockholm, etc.), some of which carry heavy reporting obligations. These conventions have fortunately secured Lebanon

In terms of national legislation, the Environment Law 444 (dated 29/07/2002) articulated 11 principles for environmental protection and management. Several of them are based on the Rio Principles and/or Agenda 21. See cross-walk between Law 444 and Rio Declaration / Agenda 21:

1. Precaution (cleaner production techniques); P.15-RD
2. Prevention (best available technologies); P.20-A21
3. Polluter-Pays-Principle; P.16-RD
4. Biodiversity conservation (in all economic activities); P.15-RD
5. Prevention of natural resources degradation; P.23-RD
6. Public participation (free access to information and disclosure); P.36-A21

7. Cooperation between central government, local authorities, and citizens; P.40-A21
8. Recognition of local mores and customs in rural areas; P.26-A21
9. Environmental monitoring; several principles of A21 including P.17 and P.18
10. Economic incentives to encourage compliance and pollution control; P.30-A21
11. EIA process to control and mitigate environmental degradation; P.17-RD

It is quite incidental that Law 444 was approved in 2002 (exactly 10 years after the Rio earth summit). It provides an umbrella framework for environmental conservation and development in Lebanon and requires up to 36 application decrees to make it implementable. The law was visionary and bold in calling for the establishment of the National Environmental Council (established recently by Decree 8157 dated 18/05/2012) and for setting up the National Environmental Fund. Unfortunately, it took almost 10 years to enact the first of several application decrees pursuant to Law 444. The reasons for this delay are numerous and confirm the urgent need to streamline the legislative development process and to expedite review procedures by the various government agencies including line ministries, the Council of State, the Council of Ministers and Parliament.

Inspired by the upcoming Earth Summit, and recognizing the urgency of the matter, the current government doubled its efforts to complete important environmental legislation. Improved inter-ministerial coordination and diligent follow-up has had an expeditious effect on the promulgation of the following important laws (approved by the Council of Ministers in January 2012):

1. Environmental Prosecutor (first draft in 2010)
2. Nature Reserves (first draft in 1997)
3. Integrated Solid Waste Management (first draft in 2005)
4. Air Quality Protection (first draft in 2005)

These laws still need to be reviewed and approved by parliament. Additionally, the Council of Ministers enacted the following milestone decrees in March 2012:

- Environmental Impact Assessment (first draft in 1995)
- Strategic Environmental Assessment (first draft in 2004-2005)

- Environmental Compliance for Establishments (first draft in 2001-2002)
- National Council for the Environment (first draft in 2005 - established by Decree 8157 - 18/05/2012))

Contingent on the government's ability to enforce them, this impressive set of environmental laws and decrees will promote environmental sustainability far and wide. They will also create hundreds of green jobs and thereby help environmental graduates find work when they enter the job market.

A quick review of other environmental legislation developed since Rio 1992 reveals the following achievements (listed chronologically):

- *Law 221 and 241/2000* reorganized Lebanon's 21 water authorities and over 200 local water committees into four new Water Establishments plus the Litani River Authority. In 2005, the COM enacted four decrees (14596, 14602, 14600 and 14598) defining the mandate and bylaws of each water establishment including personnel size and structure.
- *MOE Decision 8/1 of 2001* defined environmental limit values for stack emissions and effluent discharge from classified establishments and wastewater treatment plants. The decision disaggregates stack emission limit values by industrial sector (e.g., power plants and generators, cement, glass, aluminum, batteries, agro-foods, and incineration) and for new and existing industries.
- *Decree 8803/2002* and its amendments (2006 and 2009) outlined the National Master Plan for Quarries. Lebanon's quarry sector is notoriously chaotic and devastating to environmental resources and landscapes. While enforcement is still ludicrous, the MOE presides since 2002 the National Council for Quarries.
- *Decree 8006/2002* amended by Decree 13389/2004, categorized health care waste and set guidelines for health care waste management. The decrees have unequivocally improved Health Care Waste Management services and increased awareness of the issue.
- *Decree 2366/2009* approved the National Land Use Master Plan (prepared in 2002-2004). The plan is Lebanon's first national effort to

unify and organize land uses holistically while promoting decentralization, economic growth, and environmental protection.

- *Law 92/2010* banned all land uses inside burnt forests to prevent future acts of arson. In the last decade, Lebanon has witnessed a spate of forest fires that reached devastating proportions in 2007. The law is intended to deter potential arsonists from burning forests to harvest fuel wood or alter land uses.
- *Law 132/2010* defines oil and gas activities in Lebanese territorial waters. The GOL expedited the promulgation of the law in anticipation of imminent exploration and extraction activities as well as a looming territorial conflict with Israel. Environmental safeguards and the SEA process are prominently featured in Law 132/2010.

V.2 Environmental Institutions

The Lebanese Ministry of Environment was established after the 1992 Rio Earth Summit (Law 216/1993) and its mandate and organizational structure were amended after the 2002 Johannesburg Summit (by Law 690/2005 and Decree 2275/2009 respectively) to also include coordination of sustainable development issues. Successive Councils of Ministers have included explicit references to environmental management and sustainability in their government declarations. History shows however that the government did not provide the needed backing in terms of resources and political will to bring these commitments to fruition. See environment excerpt from the current government declaration in box 5.

BOX 5 GOVERNMENT DECLARATION (72nd COM dated 05/07/2011)

The government is keen on activating the role of the Ministry of Environment and seeking to protect the environment through the strict application of environmental laws and regulations.

Environmental strategy development and planning in Lebanon evolved gradually. For example,

the World Bank funded in 1997-1998 the first Environmental Strategy Framework. This was followed in 2002 by Law 444 that provides a logical roadmap to environmental work planning in Lebanon, and then in 2005 by the draft National Environmental Action Plan (NEAP). The NEAP was never completed nor officially endorsed. The upcoming EU Support to Reform of Environmental Governance program will assist the MOE in updating the draft NEAP. Meanwhile, successive ministers of Environment have articulated short-term work programs based on the draft NEAP. It is important to note however that the NEAP does not absolve the GOL from committing itself to a national strategy for environmental sustainability with clear implementation targets which the MOE has recently started to revive.

The MOE, like all public administration institutions in Lebanon, is understaffed and under-resourced due to time-consuming and complicated government recruitment procedures. Moreover, and even after factoring in the sum of all potential benefits (overtime pay, other compensations, bonuses, transportation and social security allowances --not exceeding 75 percent of the base salary), civil servants earn significantly less than private sector counterparts. Lack of professional incentives and notable achievements in the environmental sector have made it even more difficult to retain high-quality staff at the Ministry.

MOE's ability to exercise its mandate is limited by staff competencies and size. Although staff size has increased from just three in 1993 to 60 in 2010, this is still far less than the prescribed staff size stipulated in Decree 2275/2009 (182 full-time employees). Bilateral cooperation projects have bolstered human resources at MOE (a total of about 87 service contractors and consultants during the period 2001-2010). They helped implement many activities and functions related to environmental legislation, research, training, monitoring and environmental awareness. Partly due to staff shortage, MOE has limited procurement and spending capacity. Although MOE's annual budget increased from LBP1.375 billion (\$0.9 million) in 1993, to LBP3,975 billion (\$2.65 million)⁴ in 2001, and to LBP7.325 billion (\$4.88 million) in 2010, this remains miniscule compared to the size and complexity of environmental challenges. On the other hand, the budget cannot and will not expand markedly without a concomitant improvement in

MOE's spending capacity and procurement systems. Several government agencies, institutions, civil society organizations and programs lend support to MOE. Key among them is the *Parliamentarian Committee for Environment* which comprises 12 MPs; the *Industrial Research Institute* (established in 1955 and affiliated to the MOI since 1997); the *Lebanese Cleaner Production Center* (established by MOE in 2002 and affiliated to the Industrial Research Institute in 2004) the *Lebanese Agricultural Research Institute* (1957); the *National Council for Scientific Research* (1962); the *Tripoli Environment and Development Observatory* (2000); the *Lebanese Center for Energy Conservation* (established in 2002 at MOEW and officially registered in 2011); the *Lebanese Center for Water Conservation and Management* (created in 2010 at MOEW); and the two political parties dedicated to environment issues, namely the *Green Party of Lebanon* established in 2004 followed by the *Lebanese Environmental Party* established in 2005. The private sector also offers a number of environmental research institutions (at least 16 centers in six universities) and environmental consultancy services with specialized skillsets.

Regionally, the Lebanese Ministry of Environment is a member of the *Council of Arab Ministers Responsible for the Environment* (CAMRE). CAMRE is a regional mechanism for maintaining coordination and cooperation among Arab countries in all matters related to environment and sustainable development. CAMRE established the Joint Committee on Environment and Development in the Arab Region (JCEDAR) to enhance cooperation and coordination among Arab regional and national organizations.

V.3 Environmental Enforcement

Lebanon has a vibrant community of legal advisors and lawyers but lack adequate enforcement means and mechanisms. There is abundant evidence of environmental crimes that persist with little accountability and/or in total impunity. To date, Lebanon has no environmental prosecutors or an environmental police. To fill this gap, the Ministry of Justice has designated in each governorate a general prosecutor to examine environmental crimes and abuses. These prosecutors are not

environmental specialists, however, and their work load is significant which means that environmental crimes receive less attention than other crimes.

An environmental prosecutor is a prosecutor who is trained in environmental issues and is able to call upon the expertise of subject-matter experts as needed. They can examine and prosecute environmental crimes and violations related to forests, protected areas, biodiversity, air quality, water, soil, noise, quarries, classified establishments, municipal commons, government estates and international waters. The recent cabinet approval of the Environmental Prosecutor Law, in a relatively short time span, is testament that the COM considers this matter very urgent. Progress is also noted in the judicial system whereby the Environment Law 444/2002 is now taught to judges. Of interest to environmental prosecution and accountability is the analysis conducted by SELDAS⁵ (2002-2004) that identified legal avenues for protecting people who have been affected by an environmental crime as well as SEEL⁶ (2008-2010) that compiled a database of 469 published environmental jurisprudence cases (based on the review of about 100,000 published cases).

Since Lebanon has yet to establish an environmental police force, the municipal police and the Internal Security Forces have thus far been responsible for enforcing decisions and court sentences related to environmental abuses and pollution, with very limited success. To remedy this weakness, MOE drafted a decree (currently being discussed with the Ministry of Interior and Municipalities – MOIM) to institutionalize an environmental police in the country (pursuant to Article 8 of Law 690/2005). It will be a challenge for the GOL to establish and institutionalize such a police force, partly because the country already has a plethora of disconnected security apparatuses.

Recognizing the challenges ahead, the EU has approved €8 million in funding to provide *Support to Reform of Environmental Governance* (StREG). Slated to start in 2012 and extend over four years, StREG will improve the environmental performance of the Lebanese public sector by reforming environmental governance through four complementary angles: legal, administrative, financial and technical. The contracting authority will be the Presidency of the Council of Ministers and the beneficiary will be the Ministry of Environment.

⁵Strengthening/State of the Environmental Legislation Development and Application System in Lebanon

⁶Supporting the Judiciary System in the Enforcement of Environmental Legislation

VI. Aspirations for Sustainable Development

VI.1 Jobs – Creating More and Better Jobs

The rate of unemployment in Lebanon is cause for great concern. The social structure of Lebanese society is such that unemployment data is difficult to compile. According to CAS, and based on a population of 2.8 million above the age of 15, and an active population of 1.2 million, the unemployed represent 8.9% of the active population (about 3.9% of the total population above 15 years of age).

The GOL must overcome the political cleavages that have paralyzed budget planning and investment spending. It will need to rethink its spending priorities by placing more emphasis on Lebanon's economic sectors including tourism, agriculture, industry, and ICT. All sectors can and should accommodate a larger labor force provided that production systems are optimized, quality standards are maintained, and export markets are expanded.

The geographic distribution of jobs is equally important to Lebanon's standards of living. A concentration of jobs in the coastal zone and major cities will not necessarily improve living conditions, and cities will grow beyond their capacity. It is important to create sustainable jobs in the industrial and agricultural sectors in rural Lebanon, as recognized by the National Land Use Master Plan, and reverse the current rate of rural-urban migration. Many households would be willing to return to their home town or village, and forego a portion of their city income, if the Government can secure them respectable jobs there.

In an effort to create jobs in Lebanon, the EU is considering funding a €12M program for "Stimulating Sustainable Growth and Jobs Opportunities in Lebanon". The overall objective of this program is to support sustainable economic growth and job opportunities in Lebanon with special focus given to the youth. The specific objective is to support the shift towards a greener economy generative of new jobs opportunities through (i) "Push" of good practices, technologies through Pilot-projects with a pro-business focus; (ii) "Pull" of good

clean technologies through innovative financing and green banking; (iii) Dissemination of activities including promotion of the pilot-projects results and awareness campaign; (iv) Promotion of dialogue amongst stakeholders (Civil Society Organizations, Private/Public sectors) and support to the creation of the National Environmental Council (goal already achieved); and (v) Development of a roadmap for the green economy in Lebanon.

VI.2 Energy – Improving Energy Sustainability

Lebanon is a net energy importer (97% of its energy needs is imported) and has been hit hard by the global energy crisis. Poor energy planning since the end of the Civil War has had a compounding effect on Lebanon's energy sector (see Energy Sustainability Index in Box 6). So far, Lebanon has been relying heavily on High Emission Factor Fuels (HEFF) or "dirty" fuels such as light (mainly Gasoil and Diesel) and heavy fuel oil in its primary energy mix. Although Lebanon is a signatory to the UNFCCC, this poses no requirements for decreasing national GHG emissions. The GOL has submitted national inventories of GHGs for baseline years 1994 and 2004; these reports quantify the carbon footprint of various economic activities, assess Lebanon's vulnerability to Climate Change, and propose adaptation and mitigation strategies to reduce GHG emissions. Surprisingly, the building sector is the largest energy consumer, followed by the transport sector. The following sections describe Lebanon's aspirations and current planning to alleviate energy poverty in the country.

BOX 6 ENERGY SUSTAINABILITY INDEX

Since 2008, the World Energy Council has been ranking countries over their energy performance. In 2011, Lebanon ranked 62 among the 92 listed countries. The index is based on 60 indicators tracked across several energy policy categories covering the "Energy Trilemma:" (1) energy security, (2) social equity and (3) environmental impact mitigation.

http://www.worldenergy.org/documents/energy_index.pdf



The Electricity Sector Policy Paper

In 2010, the Ministry of Energy and Water developed the much-anticipated Policy Paper for the Electricity Sector which seeks to redress the country's ailing electricity sector by 2015. The policy paper includes 10 strategic initiatives to improve sector performance, improve supply/demand (fuel sourcing, renewable energy including wind, biomass, solar and hydro, etc.), and revamp the legal and institutional framework for energy production. The paper proposes a battery of short-, medium- and long-term measures to remedy the sector's problems, starting with increased power generation to cover the existing gap (e.g., leasing electricity-generating ships, rehabilitation of existing power plants, and construction of new power plants). The policy paper envisions that Lebanon's power generation capacity will reach 4,000 MW in 2014 and 5,000 MW after 2015.

The policy paper aims also to switch the energy mix from polluting fuels to Liquefied Natural Gas (LNG), increase electricity generation efficiency and promote renewable and alternative energy sources. To implement the switch, Lebanon would need to build an off-shore LNG terminal at Selaata or Zahrani and connect all the power stations in the country with a land (or subsea) pipeline extending from Beddawi (North Lebanon) to Sour (South Lebanon). The pipeline will follow the railway track to limit expropriation costs, and would eventually also feed industrial, commercial, and residential facilities (city gas). It could in the future also support a Natural Gas Vehicle initiative.

The energy switch would not only make the energy mix in Lebanon more acceptable (cleaner) but also more economical.

One year in the making, the policy paper was formally approved by the Council of Ministers in June 2011. The Lebanese COM agreed in March 2012 to lease power-generating ships to produce 270 MW for a period of three years, and to build 1,500 MW power plants. To ensure environmental sustainability, the policy paper would require a full Strategic Environmental Assessment.

Renewable Energy Pledge

The GOL has voluntarily committed itself in Copenhagen (2009) to increase Renewable Energy (RE) shares to 12% of the total electrical energy consumption by 2020. RE will bring significant advantages to the country by improving energy security, energy acceptability and energy independence. The spectrum of available technologies envisaged is quite wide including Wind Turbines (WT), Photo-Voltaic (PV), Domestic Solar Water Heaters (DSWH), and biomass that includes converting waste to energy and geothermal heat pumps. Already many initiatives are being implemented to favor the penetration of these technologies in the Lebanese market. For example, CEDRO recently completed Lebanon's first Wind Atlas (2011) and Biomass Atlas (2012) in support of the nascent RE market in Lebanon.

Legislation is currently being considered to introduce Feed-in Tariffs (FIT) mechanisms at EDL. Feed-in tariffs imply that consumers will be able to generate power and inject it in the grid at a preferential rate. However, allowing the private sector to invest in the energy sector requires amending Law 462 (dated 02/09/2002). FIT will go a long way towards removing economic barriers to use PV and wind turbines. Without FIT systems, there is little incentive for consumers to produce their own clean electricity from clean energy sources.

Another clean electricity production incentive tool is Net Metering. Piloted in Lebanon in February 2012, net metering allows consumers to inject generated power at their premises into the grid. Unlike FIT, the consumer will be charged the net balance of electric energy supplied and consumed. Needless to say, both FIT and NM cannot realize their full potential unless electricity is on the grid 24 hours a day.

Energy Efficiency

The COM approved in February 2012 the National Energy Efficiency Action Plan (NEEAP). The plan describes 14 initiatives:

- 1) Towards banning the import of incandescent lamps to Lebanon,
- 2) Adoption of the energy conservation law and institutionalization of the LCEC,
- 3) Promotion of decentralized PV and wind applications in the residential and commercial sectors,
- 4) SWH for buildings and institutions,
- 5) Design and implementation of a national strategy for efficient and economic public street lighting,
- 6) Electricity generation from wind power,
- 7) Electricity generation from solar energy (PV),
- 8) Hydropower for electricity generation,
- 9) Geothermal, waste to energy and other technologies,
- 10) Building code for Lebanon,
- 11) Financing mechanisms and incentives,
- 12) Awareness and capacity building,
- 13) Paving the way for Energy audit and ESCO business, and
- 14) Promotion of Energy Efficient equipment.

Funding will be mainly covered by the National Energy Efficiency and Renewable Energy Account (NEEERA), a joint cooperation between BDL, UNDP, the EU, MOEW-LCEC, Lebanese banks and private investors. So far, the account has received €24 million from the EU and it is expected to raise \$100 million locally to be invested in energy efficiency, renewable energy, and green building projects. It is anticipated that many economic sectors and interest groups (SMEs in agriculture, industry and hospitality) will be competing for limited funds.

The following key provisions and projections are included in the NEEAP:

- MOEW-LCEC in coordination with EDL launched a project to replace free-of-charge 3 million, 100W incandescent lamps with 23W CFL lamps. This project targets 1 million homes and cost \$7 million (paid by the GOL).
- Some 100 MW of wind turbines farms are planned by 2014 at a total cost of \$115 – \$190 million. The GOL will need at first to invest in a pilot wind farm

project (20-30MW) and then it will be the role of private investors to build the remaining farms through special agreements with the GOL. The Wind Atlas of Lebanon completed and launched under the supervision of CEDRO, a UNDP project funded by the Government of Spain through the Lebanon Recovery Fund, will make available much needed data that will boost WT installation in Lebanon. According to the wind atlas, the potential installed onshore wind power capacity has been calculated as 6.1 GW based on the wind speed at 80m above ground level. A prerequisite to the implementation of this scheme is the amendment of Law 462/2002. To date, at least one wind farm project (60 MW wind farm in Akkar) is ready for implementation, awaiting the amendment of Law 462 and relevant decrees.

- 190,000 m² of DSWH will be installed by 2014 as part of the “One DSWH for every house” plan. Current projections show that annual sales of DSWH will hit 50,000m² in 2014 and that subsequent growth will bring total installed capacity to 1,050,000m² by 2020, up from 210,000m² in 2010. These projections, mostly through retrofits, are challenging considering that 80% of Lebanon’s population live in cities where rooftops are cluttered with equipment, antennas, water tanks, and/or gardens. Competition for rooftop space is stiff. MOEW subsidized this program to the tune of \$200 per grant for the first 7,500 applications. The units are financed at 0% interest rate over a five year period (BDL Circular 236, 2010).
- 100-200 MW of PV farms are expected by 2013 (CEDRO already completed 80 KWp of PV projects).
- 50 MW of hydro and micro-hydro projects are contemplated by 2015 at an approximate cost of \$200 million, with significant private sector investment. If properly implemented, hydro-projects will constitute 8.7% of the 12% renewable energy pledged in Copenhagen.
- Decentralized WT and PV are installed at the consumer premises. Contemplated installed power varies between 50-100 MW at a total cost of \$250 - \$500 million through long term loans to citizens.
- 15-25 MW are expected from geothermal and waste to energy projects, at a cost of \$30-\$50

million. CEDRO is already experimenting with one small scale geothermal project in Beji village (Mount Lebanon). CEDRO developed in early 2012 a National Bioenergy Strategy for Lebanon to assess the realistic and sustainable biomass potential in the country. The strategy identified and ranked 10 bioenergy streams including residues from forestry felling (No.1) to landfill gas recovery (No. 10).

- The World Bank is working on a project to upgrade the environmental performance of the Lebanese Building Code. With the exception of Annex E of article 14 which provides incentives for double walls and double glazing, the Lebanese Building Code contains no stipulations related to energy efficiency in buildings. Green buildings are yet to gain foothold in Lebanon. Several iconic buildings were launched in recent years according to international Green Building standards (LEED, BREEAM, etc.) but these buildings are primarily high-end luxury apartments and office buildings. In 2008, the Lebanon Green Building Council was founded (LGBC) with an aim to help revise construction standards in the country in collaboration with relevant agencies and research institutions. Through a partnership with the International Finance Corporation, the LGBC developed the ARZ green building rating system adapted for Lebanon and awarded its first ARZ rating to a commercial bank in 2012.

In conclusion, the implementation of RE initiatives described in the NEEAP (WT, PV, micro hydro, geothermal, etc.) are contingent on the crucial amendment of Law 462 and the issuance of appropriate decrees.

Energy Conservation Law

NEEAP implementation requires a framework document. The Draft Energy Conservation Law approved in early 2012 by the COM (awaiting the approval of the Parliament) would provide MOEW a framework for mainstreaming EE & RE activities in Lebanon, and would institutionalize the Lebanese Center for Energy Conservation as the lead energy entity in the country for the management of EE & RE activities. The draft law proposes:

1. Conducting obligatory and periodic energy audits
2. Evaluating and assessing energy intensive projects
3. Hiring the services of energy auditors or energy services firms

4. Energy labeling of products, machines, equipment and electrical appliances
5. Energy saving in both the private and public sector
6. Brokering agreements between LCEC and institutions who want to invest in energy conservation
7. Providing tax exemptions for EE & RE equipment

If implemented, the Energy Conservation Law will create a dynamic market for energy audit firms or energy service companies (ESCO's), improve the energy efficiency of the Lebanese economy, spread technological know-how, and introduce best practices in energy efficiency. Lebanon is also applying to become a member of the International Renewable Energy Agency (IRENA).

National Energy Strategy (the missing capstone)

So far, Lebanon has already declared four initiatives related to the energy sector:

1. Electricity Sector Policy Paper,
2. 12% Renewable Energy pledge,
3. National Energy Efficiency Action Plan, and
4. Energy Conservation Law.

The GOL should now seam these initiatives together as part of a National Energy Strategy that would address all energy-consuming sectors. In particular, the strategy would tackle the transport sector (it consumes 29% of the primary energy supply) as well as the industrial and agricultural sectors. The National Energy Strategy would define Lebanon's primary energy mix, set yearly targets for primary energy consumption by sector and review and diversify energy supply sources. Until such a strategy is articulated and endorsed, Lebanon will remain subject to the vagaries of the energy markets.

Oil and Gas Activities

Approved by the GOL in 2010, Law 132 addresses oil and gas activities in Lebanese territorial waters. The Law may well represent the beginning of a long journey towards solving, albeit partially, the issue of energy availability in the country without spoiling the environment. The law provides a framework for environmental safety and protection of oil and gas exploration, drilling, transport, and de-commissioning⁷.

⁷According to Barcelona Convention Article 7, the Contracting Parties shall take all appropriate measures to prevent, abate and combat pollution of the Mediterranean Sea area resulting from exploration and exploitation of the continental shelf and the seabed and its subsoil.

In particular, and pursuant to Article 7 of Law 132/2010, the Government commissioned the preparation of a Strategic Environmental Assessment of the petroleum sector to be completed prior to awarding any rights or initiating any activities. This emerging oil and gas sector will have significant impacts on the job market (from exploration to production) and potentially lure back Lebanese expatriates with relevant expertise in the oil and gas sector. Several universities now offer courses related to the petroleum sector, which will produce a cadre of young professionals with the right knowledge base and skillset to engage in Lebanon's oil and gas activities.

VI.3 Cities – Making Them More Sustainable

Lebanon is a heavily urbanized country, with 88% of its population living in urban areas. Additionally, 45% of the population lives in urban agglomerations of 1 million people or more. The Greater Beirut Area houses 2.5 million people and has grown well beyond its service capacity. Road congestion,

intermittent water supply, insufficient open spaces and green areas, and waste generation and transport are impacting lifestyles and the quality of urban life. The GOL appreciates the need to limit urbanization and implement strategies to render our cities more sustainable. The following sections describe on-going and/or future programs to improve cities.

Improving Solid Waste Management

Waste generation is related to human activities, lifestyles, and environmental awareness. In Lebanon, the period since the 1992 Earth Summit is marked by the absence of a national vision for solid waste management and political consensus on the way forward. As such, successive governments adopted and prolonged emergency measures that were not the best ecologically but that were often the most politically-acceptable. Nationwide, an estimated 51% of all municipal solid waste (MSW) is landfilled, 32% is dumped, and the remaining 17% is recovered through sorting and composting (SWEEP-NET, 2010). Source-separation initiatives have been very limited in scope and reach (rural only) and spearheaded by civil society organizations with insufficient municipal buy-in.



The Naameh Sanitary Landfill, Lebanon's largest sanitary landfill, located 15km south of Beirut, has been receiving since 1997 municipal solid waste from a growing agglomeration totally totaling 2.5 million. Initially designed to cover 120,000 m², the Naameh landfill was expanded three times to reach about 240,000 m² in 2012. The Zahle Landfill, located in the Bekaa Valley, is relatively secluded but has consumed prime agricultural lands, a precious natural resource. The Tripoli seafront dump, located in North Lebanon, has been contained (it was retrofitted with gas extraction wells and flaring units and a 10m-high seawall to contain the waste and prevent breakage into the sea). In 2011, the COM decided to rehabilitate the Saida seafront dump in south Lebanon (created in 1982) and mitigate associated environmental impacts (beach fouling, drift waste, combustion, impact on fisheries, and an enduring eyesore). In 2010, MOE and UNDP commissioned the "Preparation of a Master Plan for the Closure and Rehabilitation of Uncontrolled Dumps." The plan identified and catalogued about 700 open dumps including 40 priority dumpsites (for municipal and construction and demolition waste).

The reliance on landfills generates a false sense of optimism; they sap other initiatives and undermine the public discourse on finding alternative and more viable treatment systems. Lebanon is too small to accommodate other large-scale landfills and must therefore do much more upstream (waste minimization and taxation) and downstream (improved treatment of organic waste and recovery of recyclables). Accordingly, the COM approved in 2010 the introduction of waste-to-energy (WTE) technologies in Lebanon to support solid waste management systems (Decision 55/2010) in major cities and alleviate pressure on the dwindling capacity of sanitary landfills. WTE technologies will require new energy regulation to authorize facility operators (municipalities and/or private waste contractors) to produce and sell energy to EDL or electricity concessions by feeding directly into their grid.

In January 2012 (COM Decision 34), the COM approved the Integrated Solid Waste Management (ISWM) Law which includes waste-to-energy technologies (Article 31). The ISWM Law describes priorities, general principles as well as resulting

responsibilities (ministries, municipalities, etc.) and the institutional framework for the integrated management of solid waste including municipal, hazardous and non-hazardous. This Law awaits parliamentary approval. It is worth mentioning here that several organizations (TERRE, Youth Shadow Government, Arcenciel) already initiated small-scale paper recycling campaigns and several leading commercial outlets and malls have started to provide biodegradable and eco-friendly bags to their customers (some of them free of charge). Up-scaling this initiative could be achieved by introducing a green tax (or mandatory fee) on regular, non-degradable plastic bags, so commonly used in Lebanon.

Outside GBA, municipalities and federations are responsible for the collection, treatment and disposal of municipal waste. Austerity measures by the GOL and delays in International Monetary Fund (IMF) transfers have prevented many municipalities from planning for and investing in proper solid waste systems. Several international development organizations (European Union, Italian Cooperation, Spanish Agency, USAID, etc.) have stepped in by providing direct technical and financial support to individual municipalities and groups of municipalities. Such support is needed and welcomed but should not hamper government efforts to develop and implement a national plan for SWM by committing the required resources.

For example, to improve the provision of solid waste services in rural areas, the Office of the Minister of State for Administrative Reform (OMSAR) has been executing (2004 - Present) a €14.2 million municipal SWM program under the EU-funded program Assistance to the Rehabilitation of the Lebanese Administration (ARLA). The SWM program included the construction of solid waste treatment facilities in rural areas of Lebanon (nine sorting and composting plants) and a medical waste sterilization treatment center in Abassieh (South Lebanon). Construction of two new sorting and composting facilities in Baalbeck (North East of Lebanon) and Tripoli (North Lebanon) are ongoing. OMSAR SWM Program has served 175 municipalities and raised awareness among 1.1 million inhabitants to (1) rethink their purchasing practices by buying products with little or no packaging and (2) sort their waste at source.

The program will also create new job opportunities in completed solid waste management facilities through O&M activities. Accordingly, OMSAR secured \$15 million from the GOL to manage SWM facilities through operation contracts either with the concerned municipality or the private sector over three years. After three years, the municipality will resume O&M activities at its own expense.

Improving Land Transport

With over 1.2 million vehicles in Lebanon, of which at least 350,000 vehicles enter and exit the GBA each day from three directions, there is an urgent need to overhaul Lebanon's land transport sector. The last decades have proven incontestably that road construction and the expansion of the existing road network is not only unsustainable but also counterproductive as it encourages higher car ownership and car dependence.

In Lebanon, rail transport began in the 1890s and continued for most of the twentieth century until it was interrupted by the civil war (1975-1990) and associated impacts including widespread infringement on the public domain. Today, mass transport is limited to low capacity buses (about 25 passengers) that have no dedicated lanes and therefore compete with private vehicles on very congested roads. Most of these buses are dilapidated and operate on low-grade Diesel oil (not to be confused with Diesel oil found in Europe with physical and chemical properties described under EN 590) contributing to urban air quality deterioration. In the GBA, there are two bus networks; one is public (operated by the MOPWT) and one is private (Lebanese Commuting Company).

See summary of Lebanese public transport fleet in Table 2.



Table 2 Public Transport in Lebanon (2007)

Road Transport	Some Figures
Public Collective Transport (Buses)	3.2 million passengers per year 61,360 bus trips per year
Private Collective Transport (Buses)- Lebanese Commuting Company	13 lines 52,385 bus trips per year
Number of Licensed Taxis	33,500
Number of Licensed Vans	4,000
Number of Red Numbers – Buses (25-55 passengers)	2,236
Number of Red Numbers – Trucks	14,000

Note: Licensed taxis and vans carry red number plates (the number of unlicensed vehicles is unknown)

Source: CAS, 2008

In 2002, the Directorate General for Land and Maritime Transport at MOPWT prepared a draft transport policy with the following seven objectives; (1) secure an integrated transport system at reasonable prices for Lebanese citizens (especially for those of low-income), (2) diversify the means of land transport (import of hybrid cars, hydrogen and natural gas vehicles, etc.), (3) manage traffic flow (explore new dedicated bus lanes, rehabilitate the railway from Tripoli to Damascus, impose a tax on vehicles when moving from a city to another, give priority to pedestrians, etc.), (4) manage vehicles parking including private cars, buses, taxis and trucks, (5) improve mechanical inspection (in collaboration with the Ministry of Interior and Municipalities), (6) improve urban planning and (7) develop expertise in the field of transport in collaboration with public and private Lebanese universities.

Government inaction over the draft transport policy has meant that the sector as a whole and the quality of transport systems and services have markedly deteriorated in the last decade. In March 2012, the COM finally approved several measures stipulated in the 2002 transport policy including the use of Diesel and natural gas in private cars, the renewal of the bus fleet and the procurement of 250 Euro V mini-buses. These measures will begin to reduce urban air pollution caused by the transport sector and also create new jobs in cleaner

transport. Implementation however will require an amendment to Law 341/2001 which banned the use of Diesel in vehicles.

Improving Air Quality in Cities

Lebanon now has a partial air quality monitoring program (Beirut and North Lebanon) which constitutes the building block for establishing air pollution management strategies in the country. While it is true that Lebanon generates more air quality data today than it did 10 years ago, Lebanon still needs to establish and maintain an accessible database on air quality as well as an air quality index for reporting air quality data to Lebanese Citizens daily.

In 2011, with a \$1.64M grant from the Government of Greece, Lebanon launched a program to enhance environmental monitoring. About \$706K will be spent on air quality monitoring in major urban cities and hotspots in accordance with the recently approved law for Air Quality Protection. It will build the capacities of relevant government agencies and major industries in air quality monitoring (e.g., procurement of air monitoring equipment and training workshops), will inform decision makers on the state of air quality in urban areas, and will increase public awareness of ambient air quality using display boards and a website. A set of policy recommendations is also one of the anticipated program outcomes.

Improving Access to Public Beaches and Parks

Lebanon needs to do much more to increase access to city parks and public beaches. Public space in the GBA including playgrounds for kids, gardens, and public beaches are in extremely low supply. Beirut proper has very few parks and those are generally poorly maintained. Beaches in Beirut (Ramlet el Baida) and north and south of the capital are either polluted by raw sewage outfalls or consumed by fuel tanks, industrial facilities, fishing and leisure ports, and/or illegal housing developments. Beirut's secret garden, Horsh Al Sanawbar, was renovated after the war but has been largely closed to the public since 1992. The Municipality of Beirut has been unable to mobilize sufficient resources and manpower to guard and maintain this 25-ha urban park.

Secondary cities such as Tripoli, Saida and Zahle fare better in terms of public spaces and gardens. The sustainability of major cities in Lebanon depends in part on the ability of local authorities to significantly increase public spaces for recreation and activities. A noteworthy example is the work of an NGO to protect the forest of Baabda near Beirut from a planned road construction and the inability of local authorities to save the forest and ensure public access to local residents.

VI.4 Food - Producing More with Fewer Resources

In 2009, the World Bank, the Food and Agriculture Organization of the United Nations (FAO) and the International Fund for Agriculture Development (IFAD) assessed ways to improve food security in Arab countries including Lebanon (WB/FAO/IFAD, 2009). This was in response to a sharp rise in agricultural commodities and food prices in 2007-2008 causing grave concerns about food security, malnutrition and increased poverty.

Arab countries import at least 50% of the food calories they consume. On average, a Lebanese household spends 20-30% of its income on food. The global rise in food prices and the fact that Lebanon is heavily dependent on imports had serious macro-economic effects, including inflation, a rising agricultural trade deficit, and

grave social distress. While some Arab countries favour food subsidies, Lebanon's food subsidies represent only 0.04% of GDP (compared to 2.1% in Syria).

In addition to fluctuations in food prices, climate change will also affect the agricultural sector worldwide. Lebanon will feel the effects mostly through the availability and distribution of water. The Second Forum on Climate Change in the Near East held in Beirut in June 2011 recognized the fact that the Near East is one of the world regions most vulnerable to climatic changes (FAO Forum Declaration, 2011). The effects of climate change will affect water availability, food security, and farmers' livelihoods. To reduce the impacts of climate change and to increase the resilience of the agricultural sectors in Lebanon, it is necessary to introduce drought-resistant crops, change planting dates and cropping patterns, improve management of rangelands, and enhance genetic selection of local breeds.

Protecting Agricultural Soils – A National Priority

Poor urban planning is eroding Lebanon's agricultural land areas (from 3,324km² in 2002 to 2,944km² in 2011, according to Lebanon's National Center for Remote Sensing). Urban sprawl, the inter-generational fragmentation of agricultural lands, the escalation of real estate markets, inadequate agricultural extension services, unsustainable farming practices, and adaption to changing markets and distribution channels are exerting enormous pressure on Lebanon's agricultural production.

Preventing further urbanization of Lebanese society and reversing the country's rural migration will require that agricultural lands are strictly protected by urban planning regulations and effectively removed from the real estate market. The culture of shame associated with manual labor must be remedied so that Lebanese youth regain faith and pride in the agricultural sector. Continued reliance on foreign labor for agricultural production is dangerous and unhealthy. The 2009 National Land Use Master Plan for Lebanon recognizes the value of agricultural lands and fertile soil to national sovereignty. It must be streamlined into all regional urban master plans before it is too late.



Improving Irrigation – Grand Schemes Await Completion

Lebanon has adopted an ambitious irrigation strategy that aims to increase irrigation potential by 30 to 50 percent in the next 30 years. But the fragmentation of irrigation planning and management among numerous government agencies has made it very difficult to effectively implement this strategy, and no overall master plan has been formulated to prioritize the investment programs and water-use of the various agencies (WB, 2010). In light of the hotter and drier conditions resulting from climate change, it has become more imperative to adopt water efficient agricultural practices such as low-till cultivation, drip irrigation, rainwater harvesting and drought tolerant crop varieties as well as to fund better research and development and expansion services to develop and bring these technologies to farmers. That said, water efficient practices must be accompanied by limits on groundwater extraction from Lebanon's aquifers already threatened by salt water intrusion (see section on water resources management).

Managing Wheat Stocks – A Successful Track Record

Lebanon is highly dependent on imported cereal, particularly wheat, and this dependence is expected to grow (WB/FAO, 2011). The country is also dealing with a sharp and sustained increase in food prices, as well as increased volatility in international wheat markets. Further concern derives from the fact that Lebanon imports nearly all of its wheat from one region, the Black Sea region. Such dependence is precarious and proved

problematic during the summer of 2010 when Russia imposed an export ban on wheat due to extensive wild fires and drought affecting harvests in the Black Sea region. Although there is no clear evidence that having a more diversified portfolio of wheat sources helps mitigate price risks, it does prevent a country from being too reliant on one source of wheat. Cooperation with neighboring Arab countries (Jordan, Syria and Lebanon) may also ease the risk of supply disruptions as well.

An indirect benefit of being a net wheat importer is reduced pressure on water resources (virtual water trade). When Lebanon imports one tonne of wheat instead of producing it domestically, it saves about 1,300m³ of freshwater that can be used in other sectors. It should be noted that Lebanon's wheat storage capacity at the Beirut port silos is very well managed. With a strategic wheat reserve that is set to last for three months, the wheat stocks were carefully managed and a bread crisis was averted during the 2006 war.

Subsidizing Agricultural Subsectors – An Expensive Track Record

Lebanon has mixed experiences in the application of agricultural subsidies. Although its market economy and tariff regime are very liberal, the GOL has used subsidy programs to support three agricultural produce: wheat, tobacco, and sugar beet. The MOET, responsible for securing Lebanon's wheat supply, subsidizes local wheat production and regulates the retail price of wheat and bread. The GOL used to also subsidize the

production of sugar beet in the Bekaa Valley. The subsidy was lifted in 1996 in response to rising production cost and the realization that the GOL could no longer afford subsidizing a declining and environmentally polluting industry.

The largest agricultural subsidy program to date is the tobacco industry, a major source of income for many people in rural areas (about 24,000 registered tobacco farmers) (WB, 2011b). The industry is grown in three regions of the country: North Lebanon (20% of the total production), South Lebanon (57% of the total production) and the Bekaa (23% of the total production). For every registered farmer, there are an estimated 1.4 additional family members and 0.9 seasonal laborers. It is estimated that about 45,000 people depend at least partially on tobacco cultivation for their livelihood.

To support tobacco cultivation and farmers in Lebanon, the Régie Libanaise des Tabacs et Tombacs (responsible for the procurement, manufacturing and selling of tobacco since 1935) buys tobacco from farmers under a quota at a pre-determined support price of around \$7,500 per Metric Ton (MT) and re-sells it at a loss on the world market, at a price of around \$3,500 per MT (values for 2008). This price support program (PSP) is becoming increasingly expensive. In recent years the Lebanese export price and world import price of raw tobacco have fallen, while the price that Lebanese farmers received increased. The Régie exports nearly all domestic tobacco production (tobacco produced locally is typically of lower quality than the tobacco demanded by Lebanese consumers) and imports a similar quantity of higher quality to Lebanese consumers. With its tax revenues from imports, the Régie covers the trade deficit and the PSP.

The PSP has been under international pressure from the WTO and WHO for artificially increasing demand for Lebanese tobacco. As such and since 2003, the Régie and the Ministry of Finance have been examining alternative ways to support farmers once the PSP is phased out. For example, instead of spending resources growing low-grade tobacco, and encouraging smoking behavior, the program could instead demonstrate and promote alternative crops adapted to the local environment; invest in improving irrigation management and transport services to diversify agricultural production; and/or provide direct cash transfer to encourage investment in new and profitable

activities. Cash payments to farmers can be made conditional on, for example, school attendance and medical checkup for children. Removing the PSP is an important step for Lebanon to reduce public spending in a non-productive sector while encouraging spending in more viable and environmentally-sustainable activities.

VI.5 Water – Balancing Supply and Demand

In 2010, the MOEW developed a National Water Sector Strategy (NWSS). The strategy, approved two years later by the COM (March 9, 2012), provides a general overview of the water sector and the legal and institutional framework, presents projections of how planned resource augmentation will meet future demand (1,800 million m³ in 2035), and identifies \$7.7 billion worth of capital investment for reshaping the water sector (infrastructure and management). This strategy aims to significantly improve water supply and irrigation and sanitation services over the Lebanese territory, with a commitment to environmental, economic and social responsibility. Specifically, the national strategy has articulated seven objectives:

- 1) Maximizing the potential and improving the quality of surface water resources.
- 2) Improving the management and protection of groundwater resources (construction of wastewater networks and treatment plants; 26 WWTP by 2020).
- 3) Fulfilling deficits through groundwater (artificial recharge of up to 200 million m³ in 2020) and/or surface water (construction of remaining dams, surface storage up to 650 million m³ by 2020).
- 4) Ensuring proper and continuous access to high quality water supply (reduce extraction from private wells and increase extraction from public wells; upgrade and /or extend water networks).
- 5) Providing adequate quantities and quality of water for irrigation (reuse of treated wastewater: up to 101 million m³ by 2020; implementation of water-saving irrigation techniques).
- 6) Increasing coverage of wastewater collection networks and treatment capacities.
- 7) Optimizing current wastewater treatment processes and sludge disposal.

Strategy implementation requires (1) improved coordination between Regional Water and Wastewater Establishment, the MOEW and

other government agencies (CDR, MOE, etc.), (2) application of a new water tariff regime, (3) promotion of private sector participation in O&M activities, (4) enhancement and modernization of the legal framework, and (5) implementation of sustained awareness and conservation campaigns. The Lebanese Center for Water and Wastewater Management has already launched several awareness campaigns on water efficiency in the country and is currently updating the national groundwater assessment study undertaken in the 1970s.

Although the National Water Sector Strategy was only just recently approved and projects to augment water resources are proceeding slowly, a significant number of municipal sewage plants and systems will become operational in the next five years (Principle 21 of Agenda 21). In total, the GOL built seven wastewater treatment plants (Tripoli, Chekka, Batroun, Jbail, Nabi Younes, West Bekaa and Nabatieh) but these have yet to go online pending the completion of the corresponding networks and/or service contracts.

Industrial wastewater treatment plants are still missing in the country and industrial wastewater is discharged into the environment with little (small-scale treatment plant within the industry) or no prior treatment, either directly into rivers and streams or through wastewater networks. To reduce industrial pollution, MOE and CDR, with a grant from GIZ/EFL, prepared a Policy Paper on Industrial Wastewater Compliance and Management. The Policy Paper provides a complete analysis of the legal framework impacting industrial wastewater treatment and disposal in Lebanon and formulates policy recommendations to improve and enforce effluent discharge standards. This paper will guide the design of the Lebanon Pollution Abatement Project (LEPAP).

Notwithstanding anticipated progress in the construction of dams and wastewater treatment plants, the GOL should begin to also prioritize “environmental water” in water sector planning. Environmental water is broadly defined as any water that achieves ecological benefits. By setting environmental water levels, the GOL can ensure that (1) sustainable volumes of water remain in rivers or groundwater reservoirs to protect ecosystems; and (2) natural flow patterns are maintained so they are compatible with the ecological processes and environmental needs of rivers and aquifers.

VI.6 Oceans – Respecting the Mediterranean Sea

Lebanon is blessed with 240km of shoreline on the eastern Mediterranean Sea. Although the GOL has signed all major conventions and protocols safeguarding and protecting the Mediterranean Sea from land based sources of pollution as well as offshore waste dumping and oil spills, the state of marine water and the coastal zone have regressed sharply since the first Earth Summit. The following examples show how Lebanon is currently respecting the Mediterranean Sea and what steps the country might take in the future to further strengthen this respect.

As a signatory to the Convention for the Protection of Mediterranean Sea against Pollution and its protocols, Lebanon is required to provide secondary treatment of wastewater from cities and towns with populations exceeding 100,000 before discharge into the sea. In the period since 1992, the Ministry of Energy and Water and CDR launched a national investment program to design and build wastewater networks and treatment plants all over the country, including 11 treatment plants to serve 4 million people-equivalent in the coastal zone and the western slopes of Mount Lebanon. So far, only two primary treatment plants are operational (Ghadir and Saida) and five more treatment plants are complete but await the ancillary networks and/or service contracts (Tripoli, Chekka, Batroun, Jbail, and Jieh). At least three plants are still in the pipeline (Tabarja, Borj Hammoud and Abdeh).

As part the Country Environmental Analysis (CEA) report for Lebanon, the World Bank estimated the cost of upgrading (1) these 2 plants from preliminary to secondary, and (2) 10 other coastal treatment plants from secondary to tertiary (WB, 2011). Although tertiary treatment would cost the GOL an estimated \$45 million in capital expenditure and \$61 million in O&M costs per year, it would present new opportunities for water reuse in agriculture, aquifer recharge, etc. Unfortunately, water establishments today exhibit moderate to severe shortage in funding and staffing and thus unable to assume O&M responsibilities of WWTPs.

Protecting the Mediterranean Sea also means protecting marine resources. The Ministry of Agriculture has banned dynamite fishing and trawling nets since 1999, imposed minimum mesh size since 1997 and regulated the scuba-diving sector since 2008. Unfortunately, the ministry lacks the equipment and manpower needed to patrol the waters and must often call upon the Lebanese Navy for support and intervention. The Ministry of Public Works and Transport also has a crucial role to play in protecting the sea by limiting the number of development permits that would consume the public maritime domain and adjacent waters. The Lebanese coastline is already dotted with fishing and leisure ports and protruding breakwaters. New sea filling projects for public and private developments should be subject to the EIA cycle and EIA findings and recommendations must be upheld to the fullest extent of the law. The GOL should levy taxes on the conditional use of the public maritime domain; this would constitute a steady revenue stream. The findings of the SEA study of the nascent offshore oil and gas sector must be carried out to completion and related findings must be integrated into subsequent activities.

Respecting the Mediterranean Sea also means designating marine protected areas and/or no-fishing areas. The MOE, civil society organizations and research institutes have worked together to establish and manage two marine protected

areas (Palm Islands and Tyre Coast Nature Reserves). Model research and local involvement in field monitoring has contributed to improved management of the reserves. More recently, MOE and IUCN implemented the GEF-funded project Supporting Management of Important Marine Habitats and Species in Lebanon to support the development of a network of Marine Protected Areas (MPAs) and an associated monitoring program to evaluate management effectiveness (2009-2011). The project provided management options for the marine environment, including marine protected areas, and supporting assessments to assist in the identification of policy and management reforms. The project also assessed the feasibility of declaring three marine protected areas (Awali estuary, Ras El Chekaa cliff, and the Beirut Airport wave breaker), and carried out detailed biodiversity assessments and inventories in those sites and produced related GIS maps. The recent \$1.64 million project funded by the Government of Greece will develop appropriate management programmes, namely an Integrated Coastal Zone Management strategy for Lebanon. The project, launched in 2011, builds on the experience of the University of Balamand in North Lebanon. ICZM is recognized as one of the most important adaptation measures to climate change. Lebanon needs to move sources of urban, agricultural and industrial pollution away from the coast.



VI.7 Disasters – Mitigation and Preparedness

Lebanon has been exposed to a plethora of natural and manmade disasters. War is the greatest form of man-made disaster that any country can experience and Lebanon has experienced three wars with Israel since the first Earth Summit. Each war caused massive displacement of people and extensive damage to public and economic infrastructure. The World Bank estimated the cost of environmental degradation alone in 2006 to reach \$729 million (3.6% of GDP in 2006). Lebanon therefore has acquired a unique capability to respond to disasters despite very limited government resources and thanks in part to generous assistance and donations from friendly nations. The following three examples illustrate how Lebanon responded to specific environmental disasters:

- 1) *Tannourine Cedars Forest (1992-Present)*. The Tannourine Cedars Nature Reserve started showing die-back symptoms and browning in 1992. The symptoms increased rapidly the following years until the cause was identified in 1998 and an appropriate response was formulated thanks to the concerted efforts of the Lebanese science and research community spearheaded by entomologists at the American University of Beirut and with the assistance of the French INRA (national research center). Lebanese Army helicopters working with the Ministry of Agriculture conducted four aerial spraying events (1999, 2000, 2001 and 2004) to suppress the insect larvae with an Insect Growth Regulator. In 2002, the insect was identified and named *Cephalcia tannourinensis* and specimens were sent to natural history museums in Europe. The case of the Tannourine cedar forest is a remarkable example of interagency and interdisciplinary collaboration, as it brought together more than a dozen agencies.
- 2) *Oil spill (July 2006)*. On July 13 and 15, 2006, the Israeli Air Force bombed two fuel storage tanks at the Jiyeh power plant, 30km south of Beirut. The spill from the storage tanks was identified as the worst oil spill in the Eastern Mediterranean and was featured in the 501 series Most Devastating

Disasters. Although the attack initially destroyed two tanks, the blockade prevented the deployment of firefighting equipment which caused the fire to spread to other tanks as well. The fire consumed 60,000 m³ and released 12,000 to 15,000m³ of fuel oil into the sea. The resulting spill affected 150km of the Lebanese coastline and parts of the Syrian coastline as well. In response to the disaster, the MOE mobilized an inter-agency response team and coordinated a two-phased cleanup campaign using materials and resources provided by several bilateral partners and international organizations worth around \$15 million. The cleanup effort was constrained by the fact that it could not start until after the cessation of hostilities (about 30 days after the attack). To date, Lebanon is still engaged in recovery efforts and the oil spill prompted six UN resolutions⁸ calling upon the Government of Israel (GOI) to assume responsibility for prompt and adequate compensation to the GOL for the costs of repairing the environmental damage caused by the spill. These calls remain unheeded and the GOL has yet to receive any financial compensation for oil spill damages from the GOI.

- 3) *Forest fires (2007-2008)*. While Lebanon experiences forest fires of various intensity and frequency every year, the fires of 2007 and 2008 decimated hundreds of hectares and prompted the GOL into action after years of idleness. Lebanon called for international assistance to contain the wild fires of 2007 and 2008 (Cyprus, Jordan, and Turkey). It subsequently acquired three Sikorsky N61 fire-fighting helicopters and formulated its first National Strategy for Forest Fire Management. The strategy has yet to be tested.

⁸Resolution 61/194 (dated 20/12/2006); 62/188 (19/12/2007); 63/211 (19/12/2008); 64/195 (21/12/2009); Resolution 65/147 (20/12/2010); and Resolution 66/192 (22/12/2011) 43



Unfortunately, Lebanon has experienced many other disasters since 1992, many of which were poorly handled by Government agencies and could have been averted. For example, the agricultural sector is routinely affected by natural disasters including flooding, inclement weather and the outbreak of agricultural pests that cause millions of dollars in damages. Repeated losses by the agricultural farming community are eroding the resource base of farmers and their ability to bounce back. The absence of agricultural insurance programs in which farmers could enroll is causing further hardships and discourages new farmers from engaging in the agricultural sector. In case of an emergency, the only recourse today is the Higher Relief Council which is cash stripped as well.

Other disasters can also strike without warning including the collapse of residential buildings with faulty foundations, accidents related to oil and gas exploration and extraction, and forecasted climate change impacts including warming and seawater rise. In response to past environmental disasters and future ones, the GOL established in 2010 the National Emergency Response Committee (NERC) (by COM Decision 103/2010 amended by COM Decision 104/2010). The committee comprises 22 members representing the ministries of National Defense, Interior and Municipalities, Public Health, Public Works and Transport, Telecommunications,

Environment, Energy and Water, Education and Higher Education, and Information as well as the Civil Defense and the Lebanese Red Cross. The NERC has been tasked with developing (1) a general framework for combating disasters, (2) a detailed contingency plan to respond to threats from various types of disaster (i.e., earthquakes, floods, forest-fires, landslides, weapons of mass destruction, wars, and radioactive threats), and (3) an emergency management plan when a disaster occurs. The Swiss Embassy has approved \$800,000 in aid to Strengthen Disaster Risk Management Capacities in Lebanon.

While planning for disasters and national emergencies, it is important to identify the drivers and to recognize their interconnectedness. The GOL must heed the recommendations of Lebanon's Second National Communication to the UNFCCC related to climate change adaptation by introducing effective early warning systems for climate change hazards and disasters that could affect agriculture, electricity, water, forestry, public health and the coastal zone.

VII. Recommendations to the UNCSD

Lebanon is committed to joining the global debate on sustainable development. Participants at and contributors to the national consultation process in Lebanon ahead of the UNCSD summit in Rio de Janeiro have identified and formulated a number of national recommendations related to social, economic and environmental sectors. Those are stated in the respective sections of this report. This section presents four recommendations to the UNCSD, also based on national deliberations (May 2012 workshop) and priorities:

VII.1 Rethinking the Global Economic Model

Much has been said about the global financial crisis and the need to rethink the way we do business. The business as usual model has clearly failed in providing services and quality of life to a growing population, be it global or national. Disparities between north and south and between east and west are no longer viable. Many developing countries including Lebanon have reached untenable national debt levels which are siphoning resources away from other productive sectors. States need a fiscal and financial space to operate and to create an enabling environment for local investors and producers. Global calls for a greener economy are applauded but should not be considered in isolation of national economies. A green economy can support national economies but cannot remedy the ills of the current economic model.

VII.2 Reforming the Institutional Framework for Sustainable Development

Lebanon is one of countless beneficiaries of the work and programs of the United Nations Environment Programme. Lebanon also recognizes the need to reform this program and strengthen its capacity so it can fulfill its mandate by establishing universal membership in its Governing Council. Lebanon advocates the need for significantly increasing UNEP's financial base to deepen policy coordination and enhance means of implementation. Lebanon supports the motion to transform the Commission on Sustainable Development into a

Sustainable Development Council that will serve as the authoritative, high-level body for consideration of matters relating to the integration of the three dimensions of sustainable development. The role and mandate of the Economic and Social Council would need to be reviewed to ensure complementarities with the Commission/Council on Sustainable Development and effective integration of economic and social policies in sustainable development.

VII.3 Establishing a Global Environmental Court

The deliberate attack by Israeli Air Force in July 2006 on fuel storage tanks in Jieh caused the worst recorded oil spill in the eastern Mediterranean Sea (See section VI.7). The disaster impacted coastal habitats, marine ecosystems, livelihoods, and the national economy. With technical and financial support from friendly nations, Lebanon launched a massive clean-up campaign and an UN-sanctioned campaign to condemn Israel and seek compensation for environmental damages. To this date, all six resolutions by the UN General Assembly have been unheeded and the will of the international community to force Israel to compensate Lebanon is apparently eroding. Lebanon therefore calls for establishing a global environmental court that would have the statutory mandate to examine deliberate acts of environmental crimes between nations and sanction ill-doing nations.

VII.4 Reaffirming Palestinians' Right of Return

Lebanon and several neighboring countries reaffirm the right of return of Palestinian refugees. Although Lebanon cannot and will not assimilate Palestinian refugees, the GOL and Lebanese society at large recognize the gravity of their plight and living conditions inside camps and other informal settlements. It is difficult to talk about sustainable development in a region where millions of refugees continue to live in untenable conditions because the global community has failed them. Ensuring the return of Palestinians to their homeland, a responsibility shared by the international community, will significantly advance sustainable development goals in the region.

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