Republic of Lebanon

Lebanon's Intended Nationally Determined Contribution

under the

United Nations Framework Convention on Climate Change

September 2015

Table of Contents

1. Introduction 1
2. National Circumstances 1
3. Adaptation 3
4. Mitigation 6
5. Fair and Ambitious 7
6. Means of Implementation 8

1. Introduction

Lebanon presents its INDC in a situation of development challenges, including, amongst other issues, a lack of security due to regional turmoil and a high level of poverty. Adaptation is a priority for Lebanon. Being a developing country with scarce water resources and high population density in the coastal areas, Lebanon is already facing and will continue to face, significant challenges as a result of climate change. The government of Lebanon recognizes that the more sustainable its development path is, the easier it will be to build resilience to climate change impacts.

National as well as sectoral planning has addressed these challenges through the development of a number of low-carbon and adaptation strategies. These strategies take a long-term view, considering for example a full restructuring of the power sector between 2011 and 2030. Lebanon's INDC builds on these strategies. The country is, however, not able to provide the resources necessary to implement these strategies completely on its own. International support is required to fully implement and track the existing adaptation and mitigation strategies and to further mainstream adaptation and mitigation throughout the economy. With regard to mitigation, the INDC has two targets: the first representing the country's own contribution ("unconditional target"), the second offering a wider mitigation target conditional on receiving international support ("conditional target"). With this INDC, the government of Lebanon strives to both build resilience and improve adaptation as it lowers emissions, and therefore take advantage of the synergies between adaptation and mitigation.

Lebanon's INDC was developed based on extensive stakeholder involvement. Mitigation and adaptation actions considered in the development of the INDC targets were selected using a bottom-up approach, employing existing sectoral plans and strategies as a basis. This approach allowed the inclusion of the most appropriate mitigation and adaptation actions for each sector and ensures full support from sectoral stakeholders who see their own planning reflected in the targets set by the INDC.

2. National Circumstances

Lebanon has made various strides towards improving its development status and is in fact designated as an upper middle income country[1]. Nevertheless, despite its many accomplishments, the country still suffers from a myriad of development challenges, mainly related to lack of security due to regional turmoil, political instability as well as massive inequality and a high level of poverty. Lebanon's poverty rate is estimated to be 28% with 8% considered extremely poor[2]. In addition, Lebanon estimates that the total cost in 2020 from climate change would be equivalent to about USD 4,000 per household. This is around a third of the average household annual earnings, which currently is about USD 12,000, as a result, many households would become impoverished[3]. A poverty reduction program that boosts the country's resilience to security and natural shocks is therefore a high priority for Lebanon.

To exacerbate matters, the Syrian crisis has led to the arrival of around 1.13 million registered refugees[4] to the country, increasing Lebanon's population by 30% in just over 2

[1] World Bank Website, Lebanon Profile (http://data.worldbank.org/country/lebanon)
[2] UNDP (2008), Poverty, Growth and Income Distribution in Lebanon
[3] MoE/ UNDP/GEF (2015), Lebanon's Third National Communication to the United Nations Framework Convention on Climate Change. Unpublished
[4] UNHCR Syrian Regional Refugee Response Portal (http://data.unhcr.org/syrianrefugees/country.php?id=122), as of Data provided by UNHCR, as of 25.08.2015.

years[5] and adding stress to the already-stretched economy and natural resources. This surge in population has led to an estimated 5% increase in road traffic and therefore in greenhouse gas emissions and air pollution. It has also led to an increase in domestic water demand for refugees of around 70 million m^3 by the end of 2014, which is equivalent to a 12% increase in the national water demand. It has also added 251 MW to the country's power needs, an increase of over 10%, noting that the electricity purchasing from Syria dropped by around 88% during the same period. This demand can currently only be met through private generators, leading to additional carbon emissions and air pollutants. Other impacts include felling of forest trees to obtain firewood[5]. This additional pressure poses a risk factor for Lebanon in its strive to achieve economic growth, and build a climate resilient low carbon economy. In fact, this has had a devastating impact on development, economic activity, social progress and the environment, overstretching the capacity of national institutions in health care, education, energy, water, sanitation and security. It has set back development or even threatened to reverse it, and has weighed dramatically on the national economy, generating a cumulative and compounded cost of about one-third of the national GDP since the start of the crisis.

Furthermore, Lebanon continues to face a difficult economic situation. According to the International Monetary Fund, the Lebanese Gross Public Debt stood at 134% of GDP by the end of 2014 (fourth-highest among 188 countries). The fiscal deficit amounted to 7.1 percent of GDP during 2014. The lack of fiscal space has translated into limited capital expenditure. Lebanon has nevertheless taken several steps towards addressing these challenges through developing and implementing government strategies and initiatives, at the national and local levels, to promote a cleaner economy. Lebanon, following the preparation of the National Energy Efficiency Action Plan 2011-2015, has updated the National Energy Efficiency Action Plan for 2016-2020 and prepared the National Renewable Energy Action Plan 2016-2020, to meet the target of 12% renewable energy by 2020 that has already been committed through the 2010 Policy Paper for the Electricity Sector. Lebanon is also preparing for the exploration of potential for the production of natural gas offshore. This would allow for considerable reduction in emissions in the power sector by replacing dependence on heavy fuel oil and diesel in power generation, and, in the long term, throughout the economy. In addition, the government of Lebanon is currently preparing a Sustainable Development Strategy that covers all sectors of the economy where climate change mitigation and adaptation issues are mainstreamed throughout. Lebanon's response to climate change will therefore require national measures aligned with other sectoral action plans and ensure that sustainable development is also climate friendly.

In December 1994, Lebanon ratified the United Nations Framework Convention on Climate Change (UNFCCC) and has since been involved in various activities aimed at spreading climate change awareness in the country, reducing national greenhouse gas (GHG) emissions, developing measures to reduce adverse impacts on environmental, economic and social systems, building institutional capacity and mainstreaming climate change into the different policies. These activities were undertaken and monitored through a platform, the Climate Change Coordinating Committee (CCCC), led by the Ministry of Environment and in cooperation with its various focal points located at the line ministries, government agencies, private sector and academic institutions.

It is under these circumstances and commitment to a cleaner and more resilient economy and in accordance with the COP decisions 1/CP.19 and 1/CP. 20 that Lebanon presents its

[5] MoE (2014), Lebanon Environmental Assessment of the Syrian Conflict and Priority Interventions

INDC which can only succeed through the cooperation of all national stakeholders and the invaluable support of the international community.

3. Adaptation

Climate change adaptation is a priority for Lebanon. Being a developing country with scarce water resources and high population density in the coastal areas, Lebanon is already facing and will continue to face several challenges as a result of climate change (Second National Communication, SNC, 2011). According to the climate models, temperatures are expected to increase by around 1°C on the coast and 2°C in the mainland by 2040, and by 2090 they will be 3.5°C and 5°C higher, respectively. At the same time rainfall is projected to decrease by 10-20% by 2040 and 25-45% by the year 2090. This will lead to substantial detrimental effects in a number of areas. Lebanon has a diverse natural environment including coastal, agricultural, forest and mountainous areas many of which have unique biodiversity and ecosystems that are sensitive to climate change.

Lebanon's electricity infrastructure needs to cope with increased demand for cooling. Temperature increases are expected to cause approximately 2,400-5,200 additional deaths annually by 2030, which need to be acted on in the public health sector (SNC, 2011). Tourism needs to adjust to rising sea levels, warmer temperatures and shrinking snow cover in the mountains resulting from an increase in temperature.

Lebanon's arid / semi-arid climate makes it poor in water resources availability and vulnerable to the impacts of climate change; the projected changes in rainfall will put tremendous pressure on national water security and produce knock-on effects in sectors such as agriculture, where around 70% of the available water is being used for irrigation. Given the projected decrease in precipitation, there is an immediate need to increase water resources through the designing and commissioning of dams and hill lakes as well as artificially re-charging the groundwater. In addition, there is a need to optimize the use of current water resources through the rehabilitation of the existing network and the installation of water meters. Lebanon is already undertaking major initiatives to ensure the availability of affordable water for domestic, industrial and agricultural use, in line with the National Water Sector Strategy (2012). However, more technical, financial and capacity building support and technology transfer is needed to optimize water storage, water use efficiency, improve irrigation systems and demonstrate reuse of wastewater.

To reduce these adverse impacts on environmental, economic and social systems, Lebanon will promote climate change adaptation through mainstreaming and building institutional capacity. The National Sustainable Development Strategy, which is currently under preparation in cooperation with the Council of Ministers, clearly highlights the importance of adaptation and points out necessary action in nearly all of its sectoral chapters. The objective is to provide security and well-being for the Lebanese people whilst increasing the resilience to climate change. Yet climate change is one of many challenges to national development in Lebanon: population growth, rapid urbanization and geopolitical location provide additional challenges, and addressing these should be pursued simultaneously to avoid working in silos through collaboration between multiple government ministries and agencies, the private sector and other relevant stakeholders.

Lebanon has already made progress in mainstreaming climate change adaptation into the biodiversity (draft National Biodiversity Strategy and Action Plan, NBSAP, 2015), water (National Water Sector Strategy, 2012), forestry and agriculture (National Forest Plan, NFP, 2015 and Ministry of Agriculture Strategy, 2015) sectors. The key actions included in these strategies are listed in Table 1 below. The actions reflect Lebanon's priorities given the

current understanding of expected climate impacts. Sectoral strategies will be assessed regularly as part of the national development process and/or when new information about climate change and impacts become available.

Furthermore Lebanon aims to reach land degradation neutrality by 2030, in line with the recommendations by the UNCCD framework. This has recently been agreed by the Committee on Land Degradation and Desertification, led by the Ministry of Agriculture. Detailed adaptation measures to suit this aim are yet to be developed.

Lebanon also continues promoting climate change adaptation in other vulnerable sectors by seeking to mainstream climate change adaptation into electricity infrastructure, tourism, human settlements and infrastructure, and public health sectors. The Climate Change Coordination Committee will thrive to continue to examine sectoral vulnerabilities, assess priorities and design/guide actions in cooperation with concerned ministries to increase resilience and minimize impacts of adverse climate change effects. The work will build on the sectoral vulnerability assessments completed for the Third National Communication as well as on other relevant studies.

Table 1: Key adaptation measures in the biodiversity, forestry and agriculture, and water sectors

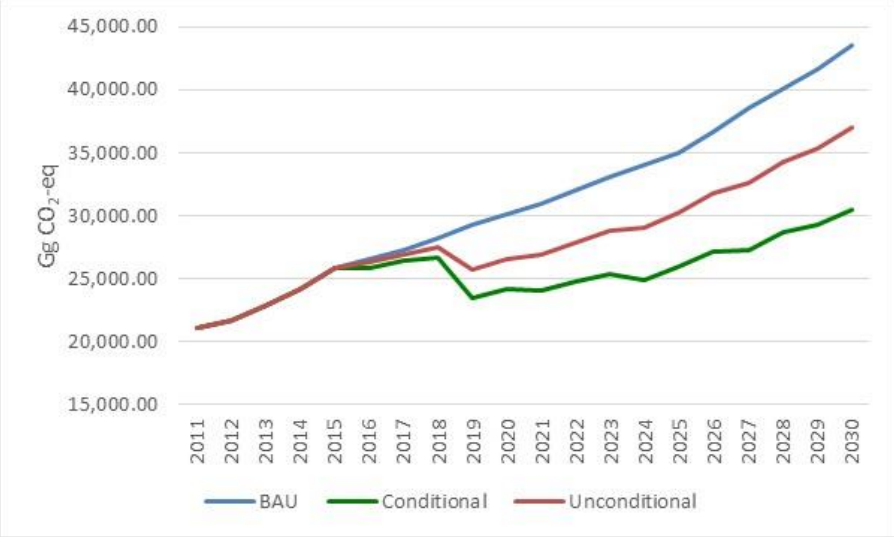
Sector	Examples of adaptation measures
Biodiversity	**Overarching objective:** By 2030, adaptation plans for ecosystems vulnerable to climate change have been developed and implemented. This will be achieved by: • Conducting needs assessment and defining pilot national monitoring sites and species. Coastal zones are considered a priority. • Designing and implementing pilot action plans.
Forestry and agriculture	**Overarching objective:** Towards sustainably managed forest resources, safeguarded ecological integrity, and economic and social development for the benefit of present and future generations. This will be achieved through the implementation of the National Forest Programme including, among others: • Raising tree nurseries' productivity. • Planting of trees. • Implementing the forest fire fighting strategy. • Rehabilitating irrigation canals. • Promoting Good Agricultural Practices through the support of organic farming and obtaining quality certificates. • Applying forest integrated pest management. • Developing an early warning system for agricultural pests and climatic conditions.
Water	**Overarching objective:** Increase water availability and improve water usage to decrease the sector's vulnerability to climate change impacts by: • Improving water security such as through increasing artificial recharge of groundwater aquifers and increasing surface storage dams and hill lakes. • Optimizing the use of the current water resources through the rehabilitation of the existing network and the installation of water meters. • Increasing wastewater collection and treatment. • Increasing water reuse, especially after wastewater treatment. • Improving water efficiency and decrease water loss in irrigation.

Climate change mitigation and adaptation policies provide many synergies and therefore call for a coordinated approach**.** A number of mitigation actions which Lebanon proposes to implement in this INDC, like planting of trees and wastewater treatment, can contribute to increasing the resilience to climate change. The forestry sector supports livelihoods in the rural areas for example by providing charcoal, fuelwood, medicinal and aromatic plants and is also important for the tourism sector. Therefore planting of trees also promotes resilience to climate change through protecting rural livelihoods and ecosystem services. In addition, better treatment of wastewater can reduce greenhouse gas emissions whilst protecting national water resources.

4. Mitigation

Unconditional Target[6]	• A GHG emission reduction of 15% compared to the Business-As-Usual (BAU) scenario in 2030. • 15% of the power and heat demand in 2030 is generated by renewable energy sources. • A 3% reduction in power demand through energy-efficiency measures in 2030 compared to the demand under the Business-As-Usual scenario. The unconditional mitigation scenario includes the impacts of mitigation actions which Lebanon is able to implement without additional international support.
Conditional Target	• A GHG emission reduction of 30% compared to the BAU scenario in 2030. • 20% of the power and heat demand in 2030 is generated by renewable energy sources. • A 10% reduction in power demand through energy-efficiency in 2030 compared to the demand under the BAU scenario. The conditional mitigation scenario covers the mitigation actions under the unconditional scenario, as well as further mitigation actions which can be implemented upon the provision of additional international support.
Emission trajectories	Figure 1 shows GHG emissions trajectories; the Business as Usual emissions as well as the unconditional mitigation scenario and the conditional mitigation scenario.

Figure 1: Greenhouse gas developments at the national level



Implementation Period	2020-2030

6 Lebanon considers that its unconditional target presumes:
1- The reinstatement, as soon as possible, of the prevailing national circumstances prior to the latest regional crisis, a matter considered as Lebanon's legitimate right.
2- The absence of the emergence of any new crisis which could adversely affect Lebanon's national circumstances.

Sectoral coverage	The INDC covers the following IPCC sectors: Energy, industrial processes and other product use, agriculture, land-use, land-use change and forestry, and waste.
Coverage of greenhouse gases	The following gases are covered: CO_2, CH_4, and N_2O. Fluorinated greenhouse gases (HFCs, PFCs and SF_6) play a limited role in Lebanon's overall GHG emissions. Furthermore, they have not been assessed at the level of detail required to estimate their emissions with the necessary accuracy needed to include them in the GHG inventory. Such assessments are currently being undertaken. Lebanon plans to include emissions from fluorinated GHGs in an updated version of its INDC.
Methodological Approaches	The BAU scenario was developed using the 2011 GHG inventory as a basis. The 2011 GHG inventory data was compiled according to the following standards: - Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, - Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, - Good Practice Guidance for Land Use, Land-Use Change and Forestry. The BAU and mitigation scenarios were developed for all sectors using the "Long range Energy Alternatives Planning System" (LEAP) software.
Key assumptions	Key assumptions for developments of the Business-As-Usual scenario were taken from Lebanon's 3rd National Communication, which is currently under preparation and will be published in 2016. For the energy sector in particular, it was assumed that national demand will grow at an average rate of 3.5% annually and that power demand which cannot be satisfied by the installed generation capacity, continues to be largely satisfied through private diesel generators. The BAU scenario does not take into account mitigation actions implemented after 2011.
Use of international market mechanisms	International market mechanisms other than the Clean Development Mechanism (CDM) are still to be developed to a stage which allows Lebanon to make an informed decision on their use in achieving its INDC target. While at present, their use is not envisaged, Lebanon does not exclude the possibility of making use of international market mechanisms to achieve its INDC targets.

5. Fair and Ambitious

Lebanon aims to embark on a long-term low-emission and climate resilient development trajectory to ensure a sustainable future for its population, despite its current challenging national circumstances. This INDC, as the first economy-wide climate change contribution Lebanon takes on, demonstrates movement beyond Lebanon's existing commitments and reflects the strategies Lebanon has developed with this long term aim in mind. In the energy sector, the long-term transformational changes include, among others, a complete restructuring of the power sector, with refurbishment, replacement and extension of power generation capacities, a fuel switch to natural gas as main fuel for conventional power

generation as well as covering a relevant share of power and heat demand from renewable energy sources. In the transport sector, restructuring is planned through a number of large infrastructure initiatives aiming to revive the role of public transport and achieving a relevant share of fuel efficient vehicles. Under both the conditional and unconditional mitigation scenarios, Lebanon will achieve sizeable emission reductions. With regards to adaptation, Lebanon has planned comprehensive sectoral actions related to water, agriculture/forestry and biodiversity, for example related to irrigation, forest management, etc. It also continues developing adaptation strategies in the remaining sectors.

The contribution put forward has to be considered against the background of Lebanon's difficult national circumstances and its regional context, as well as its low share in global emissions (0.07%).Lebanon therefore considers the targets put forward as fair and ambitious as well as contributing to achieving the objective of the Convention as set out in its Article 2.

6. Means of Implementation

The implementation of Lebanon's INDC presumes the reinstatement, as soon as possible, of the prevailing national circumstances prior to the latest regional crisis, a matter considered as Lebanon's legitimate right as well as the absence of the emergence of any new crisis which could adversely affect Lebanon's national circumstances.

Lebanon's INDC requires a strong coordination role, which includes supporting the sectors with the planning and implementation of mitigation and adaptation actions, the assessment and communication of support needs (nationally and internationally) and the monitoring, reporting and verification (MRV) related to the INDC implementation. Tasks will also have to include further mainstreaming of mitigation and adaptation, promoting mitigation and adaptation actions, improving the cooperation among ministries as well as mobilizing support for mitigation and adaptation actions. While the institutional structures for the coordination remain to be agreed, Lebanon currently envisages a dedicated coordination unit located in the Ministry of Environment, aligned with the governance arrangements for the implementation of the National Sustainable Development Strategy currently under preparation. Line ministries would remain accountable for the implementation of sectoral strategies and action plans, both at the national and local levels. The measures described above require the support of the international community in order to successfully continue the efforts put in place.

The MRV of the INDC implementation, which also requires support from the international community, will include planning and implementation of activities, assessment of impacts (GHG and non-GHG) as well as tracking of support (both national and international) needs and flows. Most of these activities are in some form already addressed by Lebanon's response to UNFCCC reporting requirements for National Communications and Biennial Update Reports. Lebanon aims to integrate the necessary MRV activities into the existing processes and structures for the international reporting to ensure an efficient and consistent approach.

Lebanon will require international support to achieve its conditional mitigation target as well as to implement its adaptation actions. This will include capacity building, technology transfer and financial support. For example, in the water sector financial and capacity building support as well as technology transfer and awareness raising are needed to optimize water storage, water use efficiency, improve irrigation systems and solid waste and wastewater treatment, and reuse of wastewater. In addition, further capacity building and financial support is required to complete an integrated monitoring and evaluation system allowing effective planning and implementation of adaptation policies.