

2015-2025

# Lebanon National Forest Program



Ministry of Agriculture

Rural Development and Natural Resources Directorate

Title:

**Lebanon National Forest Program 2015-2025**

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# The Minister

While the forest management and protection, is vested, at the official level, in the Ministry of Agriculture, the consolidation of this role requires dedication and a practical and active partnership with all those involved directly and indirectly in the forestry sector: From the farmer, the woodcutter, the mayor, the municipality, the local community, and the local authorities, down to the ministries, administrations and official institutions of both public and private sectors.

Beyond being vital and necessary green spaces to be preserved, forests do also provide habitats for different life forms. They are the natural and social spaces while being a source of economic production that will be sustainable if well planned and managed. This is provided that partnership is being translated into daily coordinated and meaningful work to secure the nation interest in every home and for every citizen.

Based on all that, we launch the National Forest Program, the result of a regional project which included Lebanon, Turkey, Tunisia, Morocco, Algeria, funded and effectively managed by the German Agency for International Development with the technical cooperation of the Forests Sciences Center of Catalonia who graciously contributed to the preparation of the program aiming to reach a unified plan for the sustainable management of the forest sector, with all what the word sustainable means of science, work and concepts based on science and behavior based experiments.

We look forward, through the National Forest Program and its implementation in the next ten years 2015 - 2025 to the sustainable forest management by updating resources assessments and encouraging relevant scientific research. Here the role of universities and research centers acquires exceptional importance, so that sustainability does not remain a slogan and forest management an administrative theory and a seasonal speech. For the studies not to remain captive of drawers, and portfolio theories, the Ministry of Agriculture will give priority, in the next decade, for the rehabilitation and restoration of degraded lands and bring life to it and ensure the sustainability of this life and thus

the sustainability of the benefits from the renewable resources available.

And because the beneficiaries of the resources are the primary guardians of the forest, the program prioritizes the benefit of the local community from the nearby forests socially and economically through the responsible use of the resources, as responsibility is the guarantee for sustainability. Organizing the use of forest resources acquires an exceptional importance and it is our responsibility with all partners to launch green economic opportunities that take into account the reality of forests ecosystems and the state of its resources and its capacities to renew these resources.

We in the Ministry of Agriculture believe in active and practical partnership, partnership-based research and study and science and work, in partnership aiming at sustainable management and protection of certain of our forests list and to increase forest areas with a reasonable cost. We deeply thank the German Agency for International Development GIZ, the Forests Sciences Center of Catalonia and the team of the ministry for seeking genuine partnerships and activation of forest management and protection and increase in size.

Akram Chehayeb,

Minister of Agriculture  
Lebanon

## Executive Summary

Lebanon, a mountainous country with a complex physical geography, extends over 10,452 km<sup>2</sup> at the eastern Mediterranean shore. Land forms, climate, soils, and vegetation differ noticeably within short distances.

Lebanese forests cover 13.2% of the total land area of Lebanon (136,900 ha), while Other wooded lands (OWL) cover 10.2% bringing the total to 237,500 ha (23.4% of the Lebanese land area) of forests, woodlands and scrub.

These forests are overwhelmed by the tremendous pressures resulting from wars, forests fires, unsustainable practices, demographic expansions and urbanization.

The present Lebanese National Forest Program (NFP) 2015-2025 will constitute the main instrument of the national forest policy steered by the Ministry of Agriculture for the upcoming decade.

The NFP identifies the government's interventions in the forest sector and beyond it, aiming at sustainably managing the Lebanese Forest Resources, while defining the coordination and cooperation mechanisms among all public and private sectors. The NFP's goals are driven by sovereignty, good governance, ecosystem-based management, and community participation.

After conducting a comprehensive SWOT analysis of the Lebanese forest sector, a vision, a mission and a list of priority actions was agreed on after consultation with stakeholders.

The resulting program of actions revolves around Forest Governance, Forest Ecosystems Functioning, and Forest Ecosystems Services. It encloses six operational Objectives and their identified activities.

Over the next decade, the MoA, along with the involved partners will work mainly on:

- Establishing and updating national data on forest and rangeland sector;
- Promoting research through the establishment of partnerships between the different sectors.
- Strengthening the governance of forestland through setting up adapted mechanisms for direct responsiveness, efficient accountability and active communication.
- Setting up sustainable management in forests;
- Establishing restoration and rehabilitation plans in degraded lands to counteract soil erosion and desertification.
- Enhancing ecosystem resilience in forestland to mitigate the impact of climate change and other natural hazards.
- Supporting small enterprises through the development of value chains standards, for sustainable production of forests and rangelands value added goods.
- Launching and supporting green economic opportunities through the establishment of the needed infrastructure to improve the related services of forests and rangelands.

The program implementation success will be monitored and verified through a set of indicators.

## List of Acronyms

<b>ACS</b>	Al-Shouf Cedar Society
<b>AFDC</b>	Association for Forest Development and Conservation
<b>ASDS</b>	Agricultural Sector Development Strategy
<b>AUBAREC</b>	American University of Beirut Advancing Research, Enabling Communities
<b>CD</b>	Civil Defense
<b>CoM</b>	Council of Ministries
<b>CNRS</b>	National Council for Scientific Research
<b>CDR</b>	Council for Development and Reconstruction
<b>CPMF</b>	Collaborative Partnership on Mediterranean Forests
<b>CTFC</b>	Forest Sciences Center of Catalonia
<b>DPSIR</b>	Driver-Pressure-State-Impact-Response
<b>DRDNR</b>	Directorate of Rural Development and Natural Resources
<b>EBM</b>	Ecosystem Based Management
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FRA</b>	FAO's global Forest Resources Assessment
<b>GDP</b>	Gross Domestic Product
<b>GHG</b>	Greenhouse Gases
<b>GIZ</b>	German Agency for International Development
<b>HRC</b>	Higher Relief Council
<b>IDAF</b>	IDAF-Instituto de Defesa Agropecuária e Florestal do Espírito Santo
<b>IDAL</b>	Investment Development Authority of Lebanon
<b>IMC</b>	Inter-Ministerial Committee (IMC)
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>ISF</b>	Internal Security Forces
<b>IUCN</b>	International Union for Conservation of Nature
<b>LAF</b>	Lebanese Air Forces
<b>LARI</b>	Lebanese Agricultural Research Institute
<b>LIBNOR</b>	Lebanese Standards Institution
<b>LRI</b>	Lebanese Reforestation Initiative
<b>LULCF</b>	Land Use, Land Cover and Forestry
<b>LULUCF</b>	Land Use, Land Use Change and Forestry
<b>LUP</b>	Land Use Plan
<b>MEAs</b>	Multilateral Environmental Agreements
<b>MEHE</b>	Ministry of Education and High Education
<b>MENA</b>	Middle East and North Africa region
<b>MAPs</b>	Medicinal and Aromatic Plants
<b>MoA</b>	Ministry of Agriculture
<b>MoD</b>	Ministry of Defense
<b>MoE</b>	Ministry of Environment
<b>MoET</b>	Ministry of Economy and Trade
<b>MoE&amp;W</b>	The Ministry of Energy and Water
<b>MoF</b>	Ministry of Finance
<b>MoI</b>	Ministry of Information
<b>MoI&amp;M</b>	Ministry of Interior and Municipalities
<b>MoJ</b>	Ministry of Justice
<b>MoPW&amp;T</b>	Ministry of Public Works & Transport
<b>MoSA</b>	Ministry of Social Affairs
<b>MoU</b>	Memorandum of Understanding
<b>NARP</b>	National Afforestation and Reforestation Program
<b>NFI</b>	National forest Inventory
<b>NFP</b>	National Forest Program
<b>NGOs</b>	Non-Governmental Organizations
<b>NNA</b>	National News Agency
<b>NRP</b>	National Reforestation Plan

<b>NWFP</b>	Non Wood Forest Products
<b>OWL</b>	Other wooded lands
<b>R+D</b>	Research and Development
<b>REDD+</b>	Reducing Emissions from Deforestation and Forest Degradation
<b>SNC</b>	Lebanon Second National Communication
<b>SPNL</b>	Society for the Protection of Nature in Lebanon
<b>SFM</b>	Sustainable Forest Management
<b>TOR</b>	Terms of Reference
<b>UN</b>	United Nations
<b>UNDP</b>	United Nations Development Programme
<b>UNCBD</b>	United Nations Convention on Biodiversity
<b>UNCCD</b>	United Nations Convention to Combat Desertification
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UNFF</b>	United Nations Forum on Forests
<b>USFS</b>	US Forest Service
<b>WFP</b>	Wood forest products

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# Chapter I.

## Overview and aim of NFP

### I.A. Background

Strategically located at the crossroads of 3 continents, Lebanon is a unique country with a heritage as old as the beginning of human existence. A country with Arabic culture tinted by Western influences, having a sophisticated character with a multicultural legacy.



Blessed with the impressive Cedars or "the most famous natural monuments in the world" as Lamartine<sup>1</sup>, the French poet, described them: *"The Cedars know the history of the earth better than history itself."*

As a mountainous country (73% of the total area), Lebanon has a complex physical geography. It extends over 10,452 km<sup>2</sup> with an average length of 225 km and width of 48 km. Land forms, climate, soils, and vegetation differ noticeably within short distances.

A major feature of Lebanese topography is the alternation of lowland and highland into four longitudinal strips that runs parallel with a north-to-south orientation:

- The extremely narrow coastal strip (the maritime plain or the Sahil) stretches along the shore of the eastern Mediterranean, hemmed in between sea and mountain.
- The western Lebanon Mountains range, also called Mount Lebanon which historically defined Lebanon. It extends along the entire country for about 170 km, parallel to the Mediterranean coast. Their highest peak is Qurnat as Sawda', at 3,088 m. The range receives a substantial amount of precipitation, including snow. The mountains were known for their oak and pine forests.
- The central plateau which comprises Beqaa valley, Lebanon's most important fertile farming region and where the Litani, longest river in Lebanon rises.
- The Eastern Lebanon Mountain Range known as Anti-Lebanon mountains form the majority of the border between Syria and Lebanon.

These features make the country an important hub for diverse types of forests and for a high number of plant and animal species. The country recognized as a mini-hotspot, is located at the heart of centers of plant diversity identified in the east Mediterranean by Boulos et al. (1994).

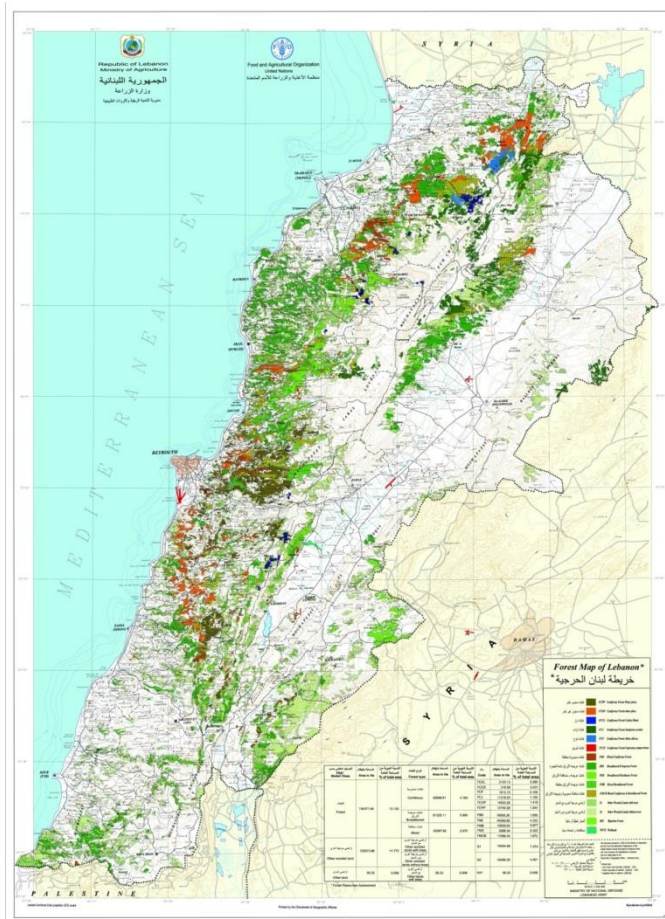
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<sup>1</sup> French poet lived in Lebanon during his voyage to the Orient (1832-33)

## I.B. Lebanese forests

Forests have long played a central role in the course of the Lebanese history. These forests are multifunctional with a broad range of goods and services which fall under either the provisioning or supporting, regulating and cultural services.

From the Phoenicians who cleared coastal areas for agriculture, and were the first to exploit this valuable natural resource on a large scale to build their famous merchant boats and to supply timber from Cedar, pine and Juniper around the Mediterranean, to the Roman times where Lebanon's trees were used extensively for lime-burning kilns. In the middle Ages, mountain villagers cleared forests for farmland, using the wood for domestic fuel and construction. During its reign, early in the 20th century, the Ottoman Empire used much of the remaining cedar forests as fuel in steam trains.



Subsequently, wars, forests fires, unsustainable practices, demographic expansions and urbanization cast their shadows over the remaining Lebanese forests. However, against all odds, forests still cover 13.2% of the total land area of Lebanon (136,900 ha). Other wooded lands (OWL) cover an additional 10.2% bringing the total to 237,500 ha (23.4% of the Lebanese land area) of forests, woodlands and scrub<sup>2</sup>. These figures make Lebanon one of the most forested countries in the Middle East as percentage of its area (Fig 1.).

**Figure 1. Lebanon Forest cover map**

<sup>2</sup> Lebanon FRA 2010

## I.C. Need for a National Forest Program (NFP) in Lebanon

In Lebanon, many stakeholders including governmental institutions, non-governmental organizations and civil society, universities and research centers, as well as international organizations are involved in the forest sector working sometimes in synergy, sometimes overlapping, and yet at times counteracting. Alternatively, there are different national policies, laws, regulations, strategies and plans, which govern forests in Lebanon, and that are either outdated, or comprising gaps.

From here, came out the need to establish a national platform for all stakeholders to combine their efforts in restoring, managing and conserving Lebanese forests. Equally important was the urge to update and modernize the existing laws and regulations in light of the emerging challenges, new management concepts and approaches, and the known multi-functionality of the Mediterranean forests.

Accordingly, the MoA mobilized all its effort at the Rural Development and Natural Resources Directorate to draw a map for the development of a National Forest Program (NFP) which will provide a framework for the development of the forestry sector in Lebanon, and a mechanism to aligning national goals with international agreements (Sustainable Forest Management), obligations (UN conventions) and resolutions (UNFF) at various levels. The NFP will be a reference to initiate forest-related cooperation between national and international organizations and local, regional and international donors.

## I.D. Main foreseen goals from setting up an NFP

### General goal

Restore degraded lands and increase Lebanese forest cover while meeting the ecological, social and economic needs of sustainable forest management at a regional scale.



### *On forest governance*

- Strengthen the institutional, administrative and technical capacities of the forest sector;
- Implement an institutional reform in the regulatory and administrative framework on the basis of Sustainable Forest Management to achieve good forest governance; Mainstream forest conservation and management into all national policies, strategies and action plans while also enhancing collaboration between all related sectors;

- Develop a sustainable funding mechanism for the forestry sector or for forest conservation and management through innovation;
- Develop a communication strategy on Lebanese forests to raise public awareness on the importance of forests and ensure full engagement of all Lebanese citizens.

### ***On ecosystem functioning***

- Restore the ecosystem functioning of all type of forests and other woodlands in Lebanon;
- Manage forest ecosystems to be resilient and adapt better to climate change and all other changing conditions including the rapid economic growth;
- Adopt ecosystem-based management to maintain ecological integrity, enhance biodiversity and protect forest health.

### ***On Ecosystem services***

- Establish value chains concepts for the goods extracted from all forest types in Lebanon;
- Initiate and promote private investment and partnership between public and private sectors in the development of forests, OWL and rangelands;
- Support the socio-economic development of low income villagers and communities, while empowering the role of women for a more balanced gender approach in all sectors of forestry.

## **Chapter II.**

### **Methodology and Presentation of the NFP**

#### **II.A. NFP's Phases and Approaches**

Recognizing the need to involve all relevant sectors, to strengthen national partnerships and to adopt a collaborative management approach of forests, MoA convened all public and private agencies to be part of the development process of the NFP.

The systematic approach adopted included the following phases:

**Phase 1.** Identifying problems and issues associated with the major topics while taking current and foreseeable future developments into account.

**Phase 2.** Define operational objectives and activities which are in line with national priority of actions and based on the internationally recognized principles of sustainable forest management.

**Phase 3.** Develop action plans and identified related activities and concerned stakeholders, and funding required.

The Lebanese NFP process implemented included the following steps:

##### ***Step 1. Launching the preparation of the NFP of Lebanon***

In 2011, an agreement between the Ministry of Agriculture (MoA) and the German Agency for International Development (GIZ) was signed to launch the preparation of the Lebanese NFP. The agreement was initiated under the umbrella of a regional project entitled “*Adapting Forest Policy Conditions to Climate Change in the MENA Region -Silva Mediterranea – CPMF*”.

##### ***Step 2. Stocktaking assessment on Governance of the forest sector***

Assessment of the current forest policy and existing laws was done from the perspective of sustainable forest management in light of the developing challenges. The study entitled “*Review and analysis of Lebanese forest related documents with a view of gap identification*” (El-Lakany H.) (Table.1). The resulting report of this analysis concluded that all laws, regulations, strategies and plans, related to forests in Lebanon have neither been contextualized nor developed with due consideration to climate change issues in their formal and currently internationally recognized meanings. Forest ecosystem services are listed among other functions of forests and wooded land but not integrated into national planning and strategies.

Document	Reference	Year
1	Agricultural Sector Development Strategy (ASDS); A plan of action	MoA 2010-2014
2	Laws, pronouncements and decrees for forests and other wooded lands and related sectors	MoA 1949-2006
3	Regulatory decisions for administering forests and other wooded land laws	MoA
4	The First Afforestation Plan	MoE 2001
5	National Forest and Tree Assessment and Inventory: Final Report	MoA 2005
6	National Biodiversity Strategy and Plan of Work	MoE 1998
7	National Strategy for Forest Fire Management in Lebanon	MoE 2009
8	National Action Program to Combat Desertification	MoA 2003
9	The Ten Year Plan of the General Directorate for Water Resources and Electricity	MoE&W 1999
10	Municipalities Laws	1977
11	A Comprehensive Land Use Plan for Lebanon (LUP)	2005
12	Analysis and evaluation of forestation efforts in Lebanon	Regato, Asmar 2011
13	Lebanon's second national communication to the UNFCCC	MoE 2011

**Table 1. Documents reviewed for the preparation of the stocktaking report**

### ***Step 3. Stocktaking assessment on forest ecosystem services and their valuation***

The assessment was executed in the context of the regional project GIZ-CPMF and under the supervision of MoA. The study entitled '*Economic values of forest ecosystem service in Lebanon: Main drivers for designing national forest policy*' (By Sattout E.), drew the attention on the manifold goods and services provided by Lebanese forests and provided recommendations in terms of forest management practices and financing options.

### ***Step 4. Sectors Assessment***

The technical team at MoA carried out a general assessment of the following different sectors related to forests: [1] Rehabilitation of degraded land, afforestation and reforestation, [2] Watershed management, [3] Grazing and rangeland management, [4] Wood and non-wood forest products, [5] Forest fires and other natural hazards (pest, diseases, etc.) management, [6] Ecotourism -other environmental services valorisation (green jobs/economy), [7] Protection of forest and biodiversity, [8] Governance of forestland, [9] Public awareness, capacity building, Research and Development in forest land and resources, and [10] Sustainable forest financing system.

### ***Step 5. Involving national stakeholders***

MoA carried consultation meetings with national stakeholders from public and private sectors through the organization of multi-stakeholders workshops. Three main events were held in Beirut on October 21<sup>st</sup> and November 17<sup>th</sup>, 2011, and on June 28- 29<sup>th</sup>, 2012.

### ***Step 6. Technical support***

In 2014, an agreement was signed between MoA and the Forest Sciences Center of Catalonia CTFC to provide technical support to the development of the National Forest Program.

### ***Step 7. Community participation***

In 2014, five additional regional workshops were completed bringing together stakeholders from local and active public and private partners in the regions discussing challenges and opportunities of the sector. The regions were selected following the official administrative divisions or Mohafazas. Accordingly, the workshops were held respectively in the Mohafazas of Nabatieh, Beqaa/Baalback-el Hermel, South Lebanon, Mount Lebanon, and Akar/North Lebanon, during the months of November and December of 2014.

### ***Step 8. Communicating the NFP***

Based on the main issues raised during the different stakeholders' workshop, an outline/draft NFP 2015-2025 was prepared. This document was subjected for discussion and reflection during a major national workshop held in May 2015. Furthermore, during review of the final document and the proposed action plan, targeted meetings or door-to-door consultation with stakeholders were further scheduled.

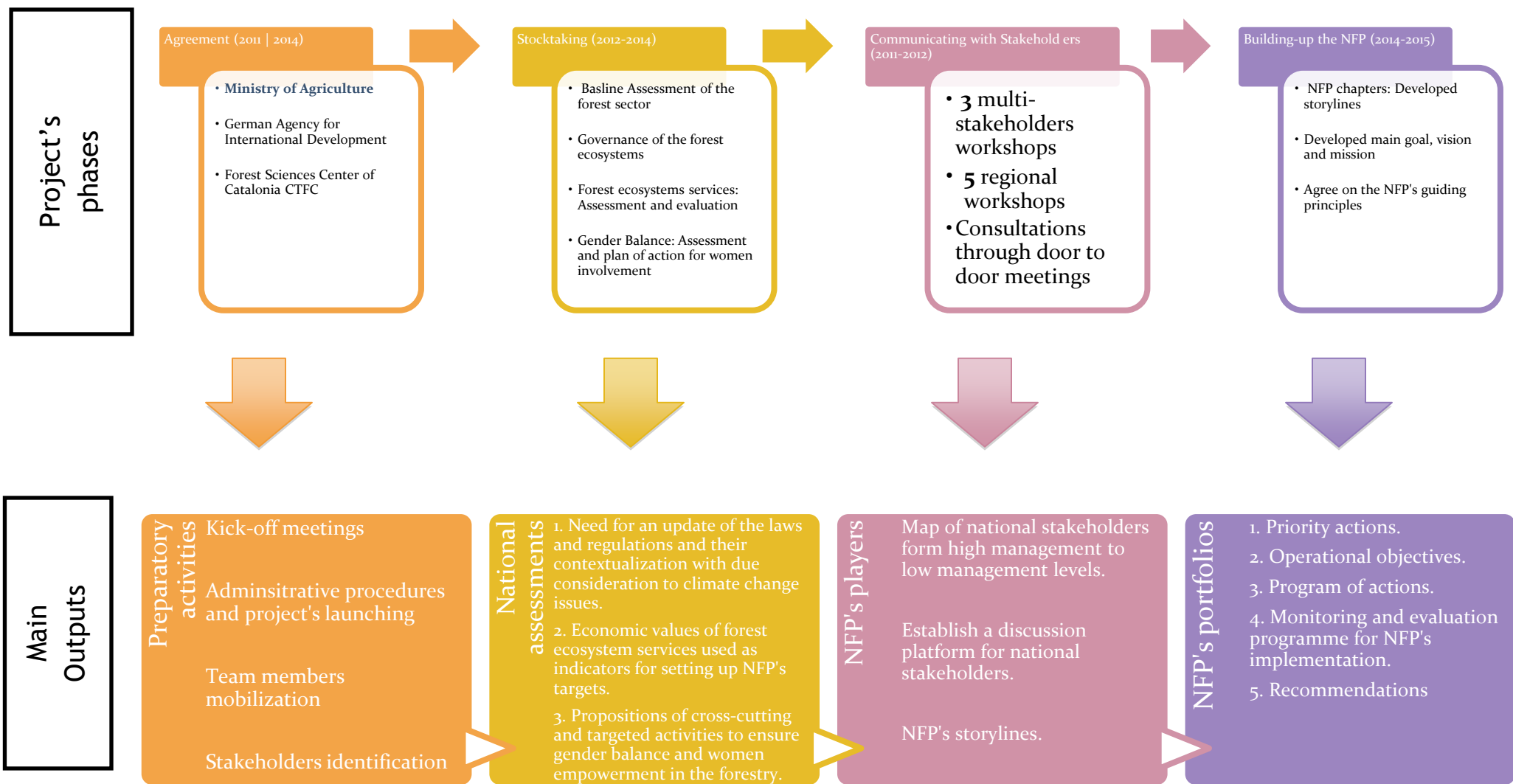
### ***Step 9. Valuing the role of women***

An assessment on the integration of the role of women in forest management was in the context of the regional project GIZ-CPMF and under the supervision of MoA. The study entitled '*Intégration de la dimension genre dans le Programme National Forestier et son Plan d'action*' (By El Iraki A.) presented a set of actions under cross-cutting issues and specific issues to empower women and leverage their standard of life through their involvement in forest conservation and management. A round table was held in MoA in June 2015 hosting various actors and activists in this area.

### ***Step 10. Outlining and developing the NFP chapters***

The consultation workshops were essential in setting up the forestry sector priorities highlighting challenges and needs at small-scale and large scale as well as at the policy development level through a bottom up and participatory approach (fig. 2).





**Figure 2.** Lebanese NFP process with hints on corresponding results and outputs from the various undertaken activities.



## II.B. Scope and Policy instruments of the NFP

The Lebanese National Forest Program is a plan of actions that defines the government's role in the forestry sector and ensures the coordination and cooperation mechanisms among all public and private sectors. The present program represents the outcome of an intensive participatory process. Its content was built over different sectors taking into account the various priorities and interests. It draws on a long-term vision and mission as well as a set of the guiding principles tapping on international strategic goals in relation to forest and rangeland management and conservation, community participation exercises, and existing national policies and strategies.

Based on the threats, pressure and priority actions to ensure the successful development of the forestry sector, the vision and mission were developed in close partnership with all stakeholders involved in the formulation of the NFP. These were finalized based on researchers and practitioners insights.

The present forest program will be the basis of Lebanon's new forest policy for the period 2015 to 2025. It will aim at mitigating the negative impacts of the sector development while foreseeing the desired status of the forest in 10 years.

### ***Vision***

*Towards sustainably managed forest resources, safeguarded ecological integrity, economic development and social thrive for the benefit of present and future generations.*

### ***Mission***

*To ensure and uphold the restoration, development and resiliency of forest ecosystems, aiming at enhanced economic growth, poverty alleviation, and biodiversity conservation, while supporting innovative participatory approach to heighten the well-being of Lebanese citizens.*

## ***NFP's Guiding Principles***

### ***a. National Sovereignty***

Lebanon has an acknowledged right to manage and use the forests in accordance with its own policies. Nevertheless, Lebanon has made an international commitment to use forest resources sustainably and without harming other States or jeopardizing the common heritage of humankind or the development options of future generations. National sovereignty is closely related to Lebanon leadership and political will as to assume full responsibility for the preparation and implementation of an NFP.

### ***b. Good governance***

Good governance embraces the habits and institutions by which authority in a country is exercised for the common good. This includes the process by which those in authority are selected, monitored and replaced; the capacity of the government to effectively manage its resources and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them.

### ***c. Consistency within and integration beyond the forest sector***

Consistency within the forest sector involves fostering synergies and minimizing contradictions in policies and national strategies and action plans which lead to negative impacts on forests through their implementation. It accounts for the significant contribution of the forest sector to Gross Domestic Product (GDP). Integration beyond the forest sector leverages and provides incentives to the private forest enterprises. Consistency within the sector also involves the recognition of customary laws, traditional rights and traditional forest-related knowledge.

Integration beyond the sector is relevant because forests serve various functions affecting other sectors (e.g. erosion control, water infiltration, biodiversity conservation, combating desertification) and they provide goods (fruits, medicine) which serve other sectors and/or overarching development goals (poverty reduction, sustainable development). Furthermore, many factors contributing to forest degradation and deforestation originate outside the forest sector, such as conversion of forests into farmland or settlements, overgrazing or unchecked wildfires, infrastructure development (roads, dams, canals, etc.), energy generation and mining. It is necessary to seek coherence in the policies of different sectors and in their implementation to avoid negative impacts on forests. On the other hand, integration ensures that forest-related measures contribute to fulfilling the objectives of multilateral environmental agreements (MEAs) they are infused in their action plans.

#### ***d. Sustainable management***

The stewardship and use of forests and rangelands in a way, and at a rate, that conserves their species diversity and ecological integrity and maintains their carrying capacity in terms of productivity, regeneration, and vitality. It also draws on their potential to fulfill relevant provisional, supporting, regulating and cultural ecosystem services for the present and future generations to come. It ensures balanced ecological functioning in line with socio-economic development, at local, national, and global levels.

#### ***e. Ecosystem-based management***

The Ecosystem Based Management (EBM) finds its foundation in the interdependence between ecosystem health and human well-being. It draws on the protection of ecosystems and landscapes, community participation, promoting all ecosystem services in a harmonized way to ensure environmental protection, human well-being and ecological integrity.

#### ***f. Community Participation***

Stakeholders in forests are all those who depend on or benefit from forest resources, or who decide on the control of or those who regulate access to forests. Participation requires a certain degree of organization and capacity and is therefore mostly in the hands of organized interest groups. They participate in NFP activities in various ways: directly or indirectly, actively or passively, in supporting or opposing roles. Community participation aims among many other things the mobilization of citizen-science program and the empowerment of women among other underprivileged groups.

#### ***g. Science –policy interface***

Science–policy interfaces are defined as social processes which encompass relations between scientists and other actors in the policy process, and which allow for exchanges, co-evolution, and joint construction of knowledge with the aim of enriching decision-making. They are implemented to manage the intersection between science and policy. They involve exchange of information and knowledge leading to learning, and ultimately to changed behavior.

#### ***h. Evidence-based science***

Evidence-based forestry is the conscientious, explicit, and judicious use of current best evidence in making decisions to enhance provision of products and services from forest resources. It recognizes that forest resource management is context specific, ever-changing, and involves uncertainties and that the best evidence is derived from a systematic process which aims to minimize bias” (Petrokofsky, Holmgren & Brown 2011, after Sackett et al. 1996 and McKibbin 1998)

#### ***i. Human well-being***

Political, economic and civil societal support for conservation can be considerably enhanced if their worth to human society at local, regional or global scales can be

quantified and economically valued. This could also be incentive for better governance of socio-ecological systems for sustainable resource use. The Ecosystem Services and Human Wellbeing approach tries to bridge this knowledge gap by introducing ecosystem services into ongoing and new societal and policy discussions.

## **II.C. NFP Chapters Outlines and Description**

The NFP include nine chapters presented in a logical framework from introducing the context and methodology, to the need of an NFP, and all the backup information to define the mission and vision, targets, activities and indicators as well as timeline and monitoring progress of work.

### ***Chapter I. Overview and Aim of NFP***

It is an introductory chapter providing a general background and overview on the importance of Lebanese forests in the regional context and at national level and the need for an NFP and identifying the responsible for its elaboration.

### ***Chapter II. Methodology and Presentation of the NFP***

It describes the approaches adopted summarized in three tasks and the process of development in ten steps shedding the light on the participatory approaches at local and national levels. This chapter also describes the thematic threshold of the NFP.

### ***Chapter III. Forest Resources and Governance Assessment***

It gives a synthetic description of Lebanon's forest land and sector involved based on the international criteria and indicators of SFM scheme. It explores the concrete national/regional situation of Lebanon.

It also presents the results of the assessment of the forests and forestry sector by providing a comprehensive description. It highlights the strengths and analyzes the problems.

### ***Chapter IV. Operational Objectives***

It describes the operational objectives based on the existing resources and MoA stand point in terms of management as well the challenges and opportunities this sector is facing. The operational objectives were defined to be realistic and achievable with the implementation of NFP action plan.

### ***Chapter V. Program of Action***

It compiles the activities needed to achieve the operational objectives based on the set NFP general objectives. Activities are concrete as much as possible and paired with a identifying the partners and defining the national competent authorities as well as partners (public and private bodies).

### ***Chapter VI. Budget and Calendar***

It provides detailed information about the timeline of the implementation of the defined activities, the budget defined into the time period of the NFP and the timetable of the intervention in relation to the monitoring of progress of work.

### ***Chapter VIII. Follow-up system***

It presents in details the evaluation process including monitoring the progress of work following the defined set of targets, action plan and budget while using the indicators identified.

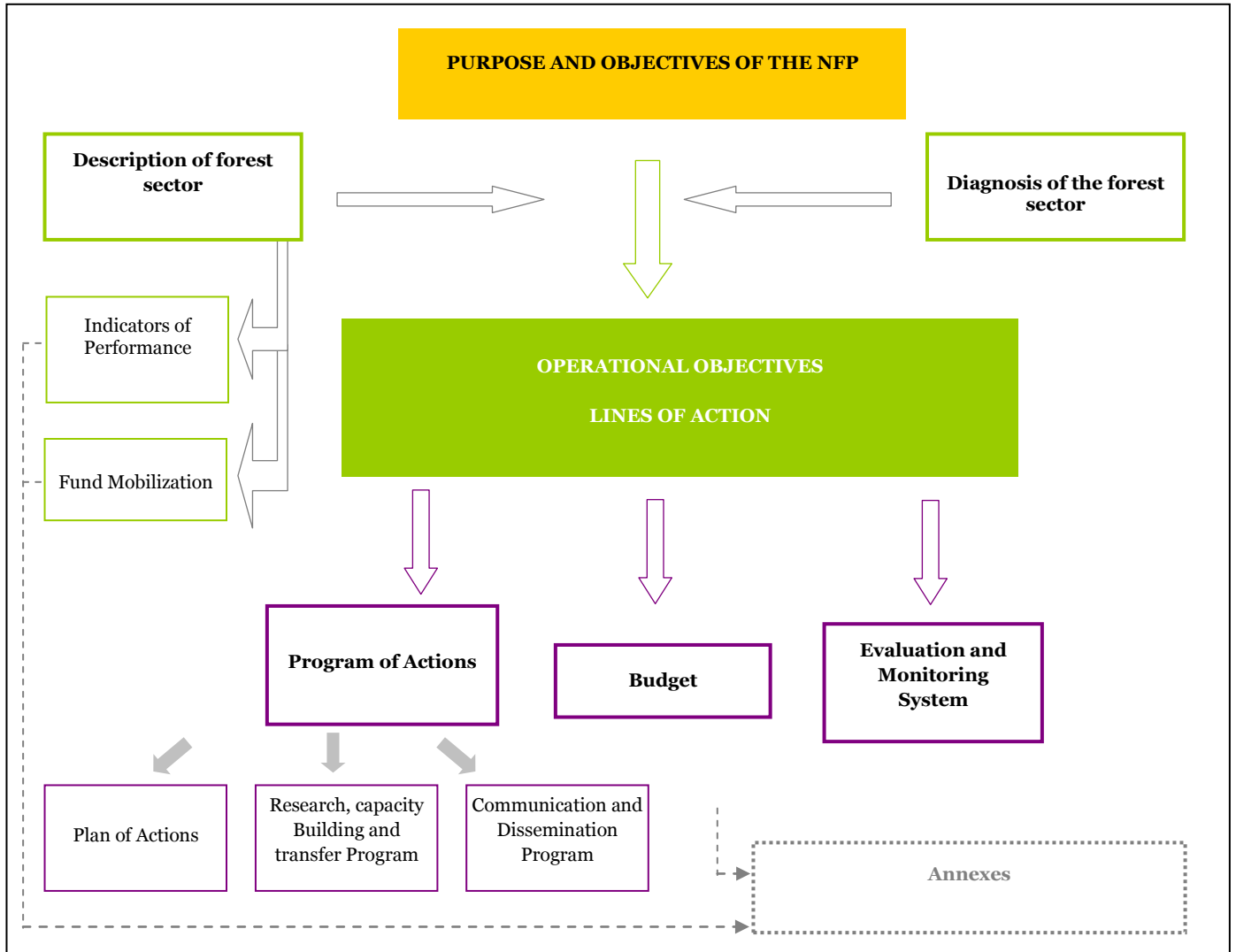


Figure.3. Liaison of the different NFP components

# Chapter III. Forest Resources and Governance Assessment

## III.A. Forest Ecosystem Functioning Assessment

### III.A.1. Description of the Forest Ecosystem Functioning

#### a) Forest Cover and Distribution

In Lebanon, forests<sup>3</sup> extend over 136.900 ha while other wooded lands<sup>4</sup> cover 106.000ha, representing respectively around 13% and 11% of the total surface of the country (FRA, 2010). They spread from the coast to reach high mountains where they grow optimally at  $\pm 1,800m$ .

Lebanese forests are broadly divided into three main classes: Mixed Forest, Broadleaves, and Coniferous, where the Mixed Forest class is defined as a forest containing at least 25% of one component and 75% of the other components. On the other hand, OWL is divided into the following classes: coniferous shrubs, Broadleaved shrub, mixed shrublands and grassland with trees.

The dominant forests are oak (41.6%), pine (20%), and juniper (8.5%). Cedar forests occupy 1.6% of the total forest area. Fir (1.2%) and cypress (0.24%) forests form a sort of pockets amidst mixed coniferous forests of cedar, juniper and pine. Mixed coniferous and broadleaved forests occupy an important portion

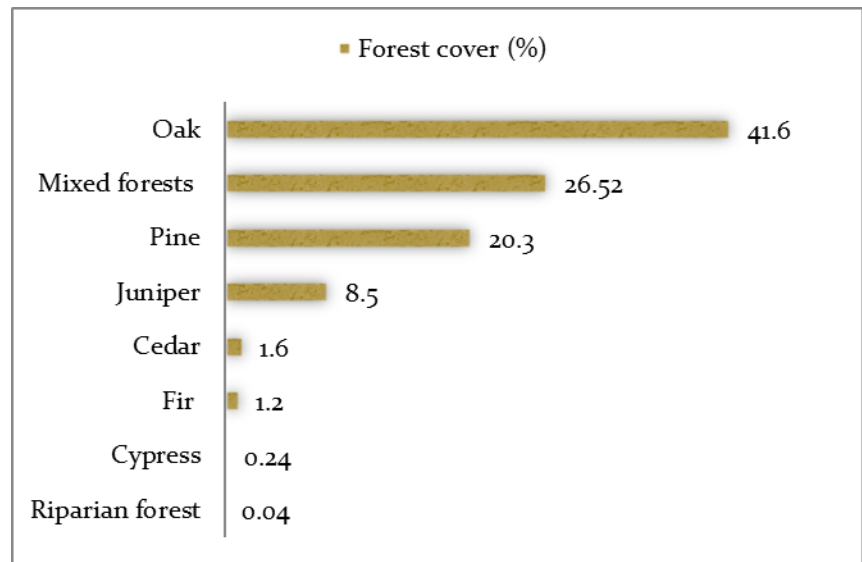


Figure 4. Forest types cover (% of total forest cover)

<sup>3</sup> Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use (FRA 2010 definition).

<sup>4</sup> Land not classified as "Forest", spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds in situ; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use (FRA 2010 definition).

(26.56%). Riparian forests occupy 0.04% of the total Lebanese forest cover (fig. 4) (ELARD, 2011; FRA, 2010).

## b) Forest Biodiversity

Though small in size, occupying only 0.007% of the world's land surface area, Lebanon is home to 1.11% of the world's plant species and 2.63% of the reptile, bird and mammal species. This unique biodiversity is generated mainly from the geology of its landscape, human practices over the centuries, along with the ecosystem transformation and adaptation to climate change. But the most influencing factors remains the country's location at the east shore of the Mediterranean basin, one of the most biologically rich and complex regions on Earth. The Lebanese natural landscape is rich, offering 9,119 species of which 4,633 are plants and 4,486 animals (NBSAP 1998). Floristic richness is estimated to include 2,600 vascular plant species of which 400 are endemic to Lebanon, Syria and Palestine (15%) and 92 are endemic to Lebanon (3.5%) (BCSR). When compared to neighboring countries, the faunal diversity of Lebanon is high relative to the country's surface area reaching 0.028 species/km<sup>2</sup>.



The changing climatic conditions along topographic gradients resulted in having two major climatic zones. These are the Mediterranean zone and the pre-steppe areas (Abi Saleh et al., 1996; Zohary, 973). Mount Lebanon chain facing the Mediterranean Sea can be differentiated into six vegetation zones (i.e. thermo-mediterranean, eu-mediterranean, supra-mediterranean, montane-Mediterranean and oro-mediterranean and montane zones). The Anti-Lebanon Mountain chain is differentiated into barren foothills supporting poor overgrazed rangelands, in addition to five vegetation zones (i.e. Batha, steppe Mediterranean, steppe supra-mediterranean, steppe montane-mediterranean, steppe oro-mediterranean). The riparian vegetation forms a fragile ecosystem playing a major role in the protection of the steep slopes from erosion and preventing watershed loss (Abi Saleh *et al.*, 1996).

## III.A.2. Analysis of the Forest Ecosystem Functioning

High biodiversity richness in forests has a major impact on the ecosystem functioning. This factor strengthens forests in plant production, ecological



resilience, resistance to environmental perturbations as well as pests and diseases. Biodiversity has an implication on ecosystem processes such as soil nitrogen levels, erosion control and soil formation, water catchment and storage, plant productivity, and pest and disease cycles.

As a result of the changes in forest ecosystem functioning resulting from anthropogenic factors and climate change, forests became sort of fragmented habitats with high vulnerability. Anthropogenic activities and socio-economic changes have had cumulative impacts on the Lebanese forests. Annual deforestation is estimated at 0.4 percent (LULC, 1998). Rapid growth, urbanization and land conversion, overexploitation of forests and rangelands resources, biological invasions, intensification of agriculture and desertification have led to forest degradation and habitats fragmentation. These are coupled with the loss of species, loss of habitats, and increase in species vulnerability and alteration in the aesthetic value of the landscapes. Some forests showed high vulnerability while other demonstrated low threat value (Table 2.).

<b>High threats/pressures</b>	<b>Very high threat value</b> Cedar forests Mixed cedar and fir forests Riparian forests Juniper forests	<b>High threat value</b> Oak forests Cypress forests Woodlands Rangelands
<b>Medium threats/pressures</b>	<b>Medium Threat value</b> Oak forests and Stone pine forests in some areas	<b>Low threat value</b> Stone pine forests Calabrian pine forests
	<b>Low distribution</b>	<b>High distribution</b>

**Table 2.** Vulnerability status of the different forest types in Lebanon.

Many forest species in Lebanon have been identified as vulnerable to climate change. The vulnerability traits will be expressed by a decrease in the regeneration rate, population rate and overall area. *Juniperus excelsa* is classified as very highly sensitive, followed by *Cedrus libani*, *Abies cilicica*, *Quercus cerris*, *Fraxinus ornus* and *Ostrya carpinifolia*. The forest stands expected to be the most impacted are in North Lebanon (Akkar) and Hermel areas due to the shift from sub-humid to the semi-arid bioclimatic level (MoE, 2011).

It is noticeable that Lebanon is being affected by climate change. The impacts are revealed by an increase in forest fires incidents, pest and disease outbreaks as well as invasiveness of alien species<sup>5</sup>. According to the EU census the average

<sup>5</sup> In 1998, Lebanese forests have witnessed an increase in pest infestation, with the attack of Cedar stands in Tannourine forest by *Cephalcia tannourinensis*, an outbreak that has been closely correlated to the length of the snow cover period over the last decade (MoE, 2011).

burnt areas varied between 1,200 to 3,000ha in the last decades with hot and dry summers resulting from changes in climate conditions (MoE, 2013). The changes in GHG emission result from changes in land use, land cover and forestry (LULCF) sector. Annual deforestation is estimated at 0.4% while annual reforestation is estimated 0.83% (LULC, 1998).

An analysis of the strengths, weaknesses, opportunities and threats gives insights on the priority actions that have to be considered on the top of national priorities to ensure the ecological integrity and resilience of forest ecosystems (Table. 3). The importance of ecosystem functioning in protective forests is revealed in the high value of ecosystem services such as regulating and supporting services.

Strengths	Weaknesses
<p>Many bioclimatic zones High biodiversity High value species Home to narrow and broadleaves endemic species A range of economic trees and underutilized Biological and botanical importance of native forest trees</p>	<p>Absence of consolidated and comprehensive national database on forest ecology, carrying capacities, and other important aspects of ecological integrity. Absence of national research agenda on forest to serve national needs and policy Low expertise in community based conservation and collaborative management practices. Reforestation initiatives targeting very few species</p>
<p>Resilient tree species (the preservation of genetic diversity with adaptation traits to harsh environment) Wide range of native species that can be used in reforestation with high adaptation traits Highly diversified forests</p>	<p>Fragmentation Degradation of forest ecosystems Loss of forest biodiversity Soil erosion Scarce watershed</p>
Opportunities	Threats

Table. 3. SWOT analysis of forest ecosystem functioning.

### III.B. Forest Ecosystems Services Assessment

#### III.B.1. Description of Forest Ecosystem Services (Importance and economic values)

In Lebanon, forest ecosystems play a major role in the life of villagers and city dwellers as source of provisioning, regulating and supporting services as well as cultural ones. They are sources of direct goods (e.g. charcoal, pine kernels, honey) and services (e.g. amenity, watershed protection, carbon sequestration). Villagers rely on direct and indirect products in their livelihood. Lebanese forests represent important hubs for city dwellers in search for recreational activities, which improve human well-being. Lebanese forests share is 0.5% of the national GDP.

The estimates of the TEV resulted in US\$181,274Millions, which corresponds to US\$587/ha<sup>6</sup>. Even though the TEV value is high, these are referred to as indicators to guide the present national policy.

The TEV estimates revealed that the highest benefits corresponded to Non-Wood Forest Product (NWFP) (39%), water catchment and storage (28%) and socio-cultural value (17.7%) (fig. 5). Provisioning services on which local communities depends constitute 44% of the ecosystems services benefits where NWFPs occupy the largest portion. Cultural services occupy an important share of 18% where education and recreation are both identified as integral components of these services. These latter depend partly on the conservation of forest ecosystems (habitat/support services) which value constitutes 4.7% of the total benefits from forest.

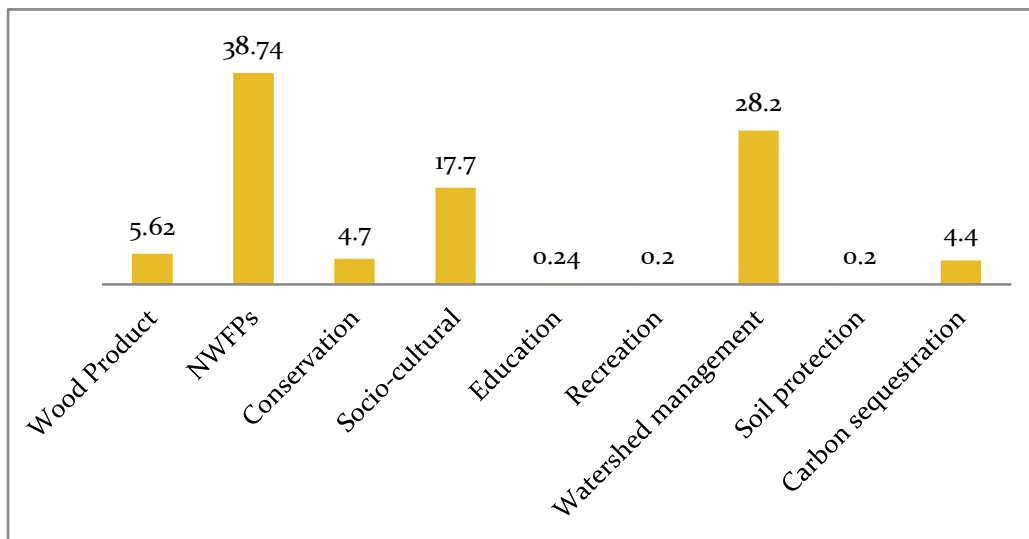


Figure 5. Distribution of the values (%) of Lebanese forest ecosystem services components.

### III.B.2. Analysis of Forest Ecosystem Services

The valuation of ecosystem services revealed the importance of the multi-functionality of Lebanese forests. The high values recorded for NWFPs and WPs (Sattout, 2014) showed the potential for investing in forest enterprises with small and medium scale (Table. 4), in addition to the importance of empowering women and their involvement along with the local communities. Valuation exercises revealed the gaps in the national forest database, demonstrating the importance of the database to be integrated in national GDP. Among all, the high

<sup>6</sup> In comparison with other Mediterranean countries, the value is too high as the average corresponded to US\$243/ha (Merlo & Croitoru, 2005).

value of hunting shows the potential impact of the service which affects on bird's species and the ecosystem functioning as well.

Strengths	Weaknesses
<p>Multi-functional forests            Variety in the provisioning services which allows the establishment of SMEs in villages            High indicators values on watershed management</p>	<p>TEV of forest ecosystem services not accounted in national GDP (officially)            There is no consolidated database on forest products            Absence in national database on regulatory and supporting services</p>
<p>Develop value chains for WPs and NWFPs            Potential Rangelands in arid and semi-arid areas            Potential for development of industries in rural areas</p>	<p>High frequency in forest fires            Illegal use of forest products            Absence of a monitoring and control systems</p>
Opportunities	Threats

Table. 4. SWOT analysis of forest ecosystem services.

### III.C. Forest Governance Assessment

#### III.C.1. Forest Governance Description

The Ministry of Agriculture (MoA) is the lead government agency entitled the protection and management of forest resources. The Rural Development and Natural Resources directorate at the MoA is the national authority responsible of the development of national strategy for the protection and management of forests and rangelands. The state owned forestlands account for 27.3% of the total forest cover while communal lands constitute 11.6%<sup>7</sup>. The highest occupancy of forestlands is privately owned (60%) and includes the religious owned lands (Fig. 6) (FRA, 2010).

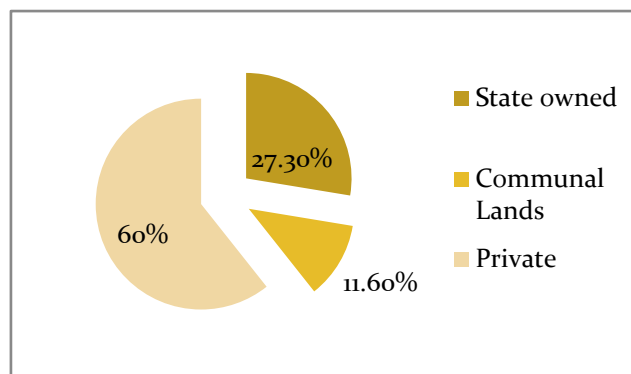


Figure 6: Forest ownership by percentage

#### a) Labor force in the forestry sector

<sup>7</sup> Municipalities owned land: 10.4% | Community owned land: 1.2% (from the country total surface areas)

Forests contribute to the Lebanese labor force, forming 0.13% of the total Lebanese workforce. The total number includes the public servants affiliated to the directorate and regional departments of rural development and natural resources at the MOA (53), forest guards (140) (MOA database, 2013), members of four protected areas and affiliated members working on forest biodiversity protection at the MOE (MOE-personal com. 2013), workers in the production of charcoal (49) and those in the maintenance of stone pine forests (1736)(FRA, 2010). The self-employed forest workers constitute 33%.

## **b) Legal framework regulating the forest related issues**

Currently, many laws, decrees, and ministerial decisions are applicable to the designation, protection and management of forests. In addition, the Lebanese Government issued national strategies for the protection and management of these forests.

Below are the most important documents related to forest and range management:

- **Forest code of 1949:**  
This law outlines the forest management and protection, and regulates forest activities including grazing, pruning, coppicing, thinning and charcoal production.  
First clause defines the “Forest” mainly as source of industrial wood and fuel. The forest code classified forest into four categories according to ownership (state-owned, state-owned with utilization rights for villages, municipalities and village-owned and private forest),  
Several amendments to Forest Law, dealt with criminalization of illegal operations and acts, (law No. 195 of 2000). Penalties are in the form of fines (between 50000L.L and 2000000 L.L) or/and imprisonment (from three months to three years).
- **Law No. 85 dated 7 September 1991:**  
This law imposed severe restrictions on forest activities and a total ban on harvesting and cutting resinous trees. It stipulates that all cedar, fir, cypress, oak, juniper and other forests in Lebanon are protected.
- **Law No.558, dated 24 July 1996:**  
The law No. 558 considered all coniferous forests protected (state-owned and municipality-owned forests)  
The protected Forest Law stipulated the creation of a forest protection service under the department of rural development and natural resources at MoA;this service is not implemented yet. Also it provided the basis for the designating of protected forests in terms of demarcation, management, financial support, supervision, activities, violations and citations: specifically maintenance of forest cover, improving forest productivity ensuring continuous yield,

management of protected areas, afforestation and reforestation, regulating hunting and grazing; and geographic zoning of forest lands nation-wide.

In addition to these laws, many administrative decisions were issued for forest management and control:

- Decisions No. 705/1, dated 11/8/2012, 731/1 dated 22/8/2012 and 322/1 dated 15/4/2014 which set several rules and procedures to organize cutting, exploitation of forests, other wooded land and trees outside forest.

Regulatory measures and decrees have eventually tackled issues related to the sustainable exploitation of aromatic plants. Laws are detailed in Annex 1.

### **c) National policy instruments related to forest ecosystems**

Besides the international conventions signed and ratified, the Lebanese Government issued national strategies with various goals and objectives aiming at the protection and management of these forests (Annex 2). Even though the development of national strategies and action plans has been prolific, there is an urgent need for the design of 'simplified' mechanisms of implementation interlinking national targets in the forest sector and other related sectors. Policy instruments show a lack of communication between the different public authorities and the leading agencies in the research community, private sectors and civil societies. There is a need to mainstream efforts between the various concerned parties and engage on effective dialogue among various stakeholders in a sustainable way.

### **d) Stakeholders mapping**

The forest sector holds various yet important stakeholders of diverse natures. These range from primary players of public and private nature to secondary and tertiary entities at the central, regional and village level.

Stakeholders are identified to belong to the following categories which in no way reflects their degree of influence or even their potential to impact the forests, its related services, resources and the rangelands.

In this context, stakeholders can be classified as follows:

- 1- Public and private
- 2- Governmental and Non-governmental
- 3- For profit and not for profit
- 4- Local and international
- 5- Individual or group entities

Effective mapping of the stakeholders does not show the interaction among them but further identifies their potential impact on the sector management while comparing it to their actual influence exerted on the forest and the forest sector.

		<b>Capacity of Stakeholder in Forests</b>	
		<i>High</i>	<i>Low</i>
<b>Interest of Stakeholder in Forest</b>	<i>High</i>	Ministry of Agriculture <sup>8</sup> Ministry of Environment Universities/Research Council and Institutes Inter-Ministerial Committee of the 40M trees programme NGOs	Directorate General of Urban Planning Municipalities Council or Development and Reconstruction Ministry of Transport and public works Higher quarry council Landowners Investors/Private sector Direct users <sup>9</sup> Indirect users
	<i>Low</i>	Ministry of Finance International Agencies Regional Development Banks Donors NGOs	Ministry of Interior and Municipalities Ministry of National Defense Ministry of Tourism Ministry of Education Ministry of Media

Table 5. Key stakeholders relative interest and capacity

### III.C.2. Analysis of forest ecosystem governance

Lebanese Forests have been for long time underrated and no special attention was given for the development of the sector. Few years ago, awareness at the decision making level regarding the important natural assets of Lebanese forest along with the threatening danger of climate change and urban pressure, pushed Lebanese government, NGO's, local communities and research centers, to make noticeable efforts to protect and develop this sector. Meanwhile, the conservation and restoration including reforestation initiatives have established learning by doing systems which boosted individual and institutional leadership skills and profile. A more than 25 years of community practices is well established at national and local levels to ensure success in the forest sector (Table 11.).

<sup>8</sup> Department of Rural Development and Natural Resources and Department of rangelands and public gardens

<sup>9</sup> Producers, Beekeepers, Producers, Pine kernels, Charcoal producers, Women gatherer of MAPs, Carob small industry and brokers, Shepherds.

Efforts made by all stakeholders is not balanced and not coordinated which leaves a lot of efforts made with no considerable impact measured on the ground. Active coordination among actors of primary, tertiary level and among public and private entities is necessary to channel the resources, the efforts and monitor the activities for more effective governance and impactful results.

Mainstreaming of existing laws and regulations with the international commitments is needed as to leverage the sector to the international standards and meet the present challenges while responding to the priority interventions

The flow of information between the public and the private entities requires support to facilitate the transfer of information to the intended beneficiaries horizontally and vertically.

Further investment in easing up, facilitating and simplifying legal and regulatory measures are requested to provide appropriate follow up to the main beneficiaries at the rural level.

<b>Strengths</b>	<b>Weaknesses</b>
<p>Existing national partnerships with international organizations Accomplished and ongoing national projects and programs on afforestation and reforestation in Lebanon. Exponential growth of capacity development with the support of internationally funded projects of staff, local communities and end-users. Alignment of national strategies with emergent challenges facing the forest sector. Infusing environmental concept in the national education strategy.</p>	<p>Law violation and law limitation Limited governmental financial resources Lack of awareness among local population regarding forest regulation and laws. Absence of a clear demarcation, classification, and registration of forestlands Absence of implementation mechanisms of national forest policy instruments Few number of informed direct and indirect users on forest governance and rangelands. Technical and institutional capacities in forest-related institutions are weak Lack of cross-sectoral cooperation at all levels synergies between national action plans of different MEAs, national and regional initiatives is non functional</p>
<p>Reforestation is recognized as a strategic priority (Lebanon's flagship program). Increase of the forest guards at MoA from 140 to 300 guards. Presence of strong NGOs network with diverse expertise Existing knowledge at the research centers and universities Lebanon's forest seedling production nurseries are empowered Planning of large-scale reforestation activities in line with the NRP.</p>	<p>Government policies not accounting for rural areas which lead to migration of rural communities Unsustainable funding mechanism absence of sustainable practices for the forest resources use at community level Lack of effective monitoring and inspection processes Lack of accountability Lack of sanction system for infractions in forest sector Lack of specialized law inspectors, judges</p>
<b>Opportunities</b>	<b>Threats</b>

Table 6. SWOT analysis of forest ecosystem governance.



### **III.D. Synopsis on forest ecosystem functioning, services and governance with the priority actions identified**

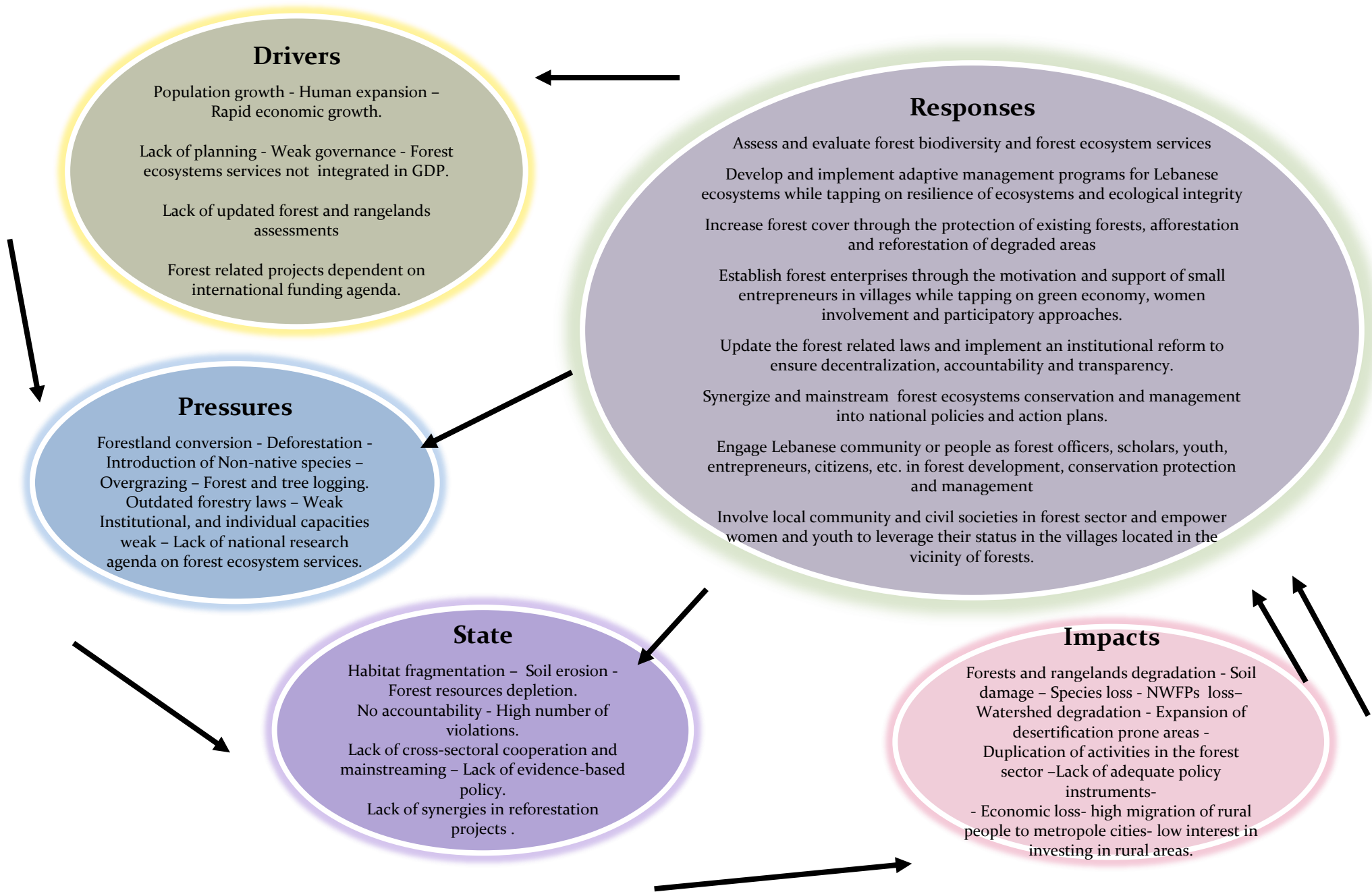
Leveraging the forest sector in Lebanon entails the consideration of important aspects related to building on the existing successes while also supporting the transformation of negative statements into opportunities for exploration.

The sector, as introduced, holds an important potential for improvement and development presenting opportunities to explore economically, socially and culturally.

Important investments are needed to support the development of the sector to a more competitive one able to provide opportunities to the local stakeholders in various ways.

The accompanying of this development requires active collaboration and coordination between the various actors coupled with appropriate governance measures and accounted for in the economic strategies and policies.

**Figure 7. The driving forces, pressures, state and impact on forests and the corresponding priority actions**



# **Chapter IV.**

## **Operational Objectives**

### **IV.1. Preamble**

The drivers leading to the present state of the Lebanese forests tap in a set of anthropogenic activities and socio-economic changes including rapid growth, urbanization and land conversion, overexploitation of rangelands and forest resources, biological invasions, intensification of agriculture and desertification. These factors have led to the degradation and fragmentation of forest ecosystem, loss of species, fragile ecosystems. They have altered the aesthetic value of the Lebanese landscapes.

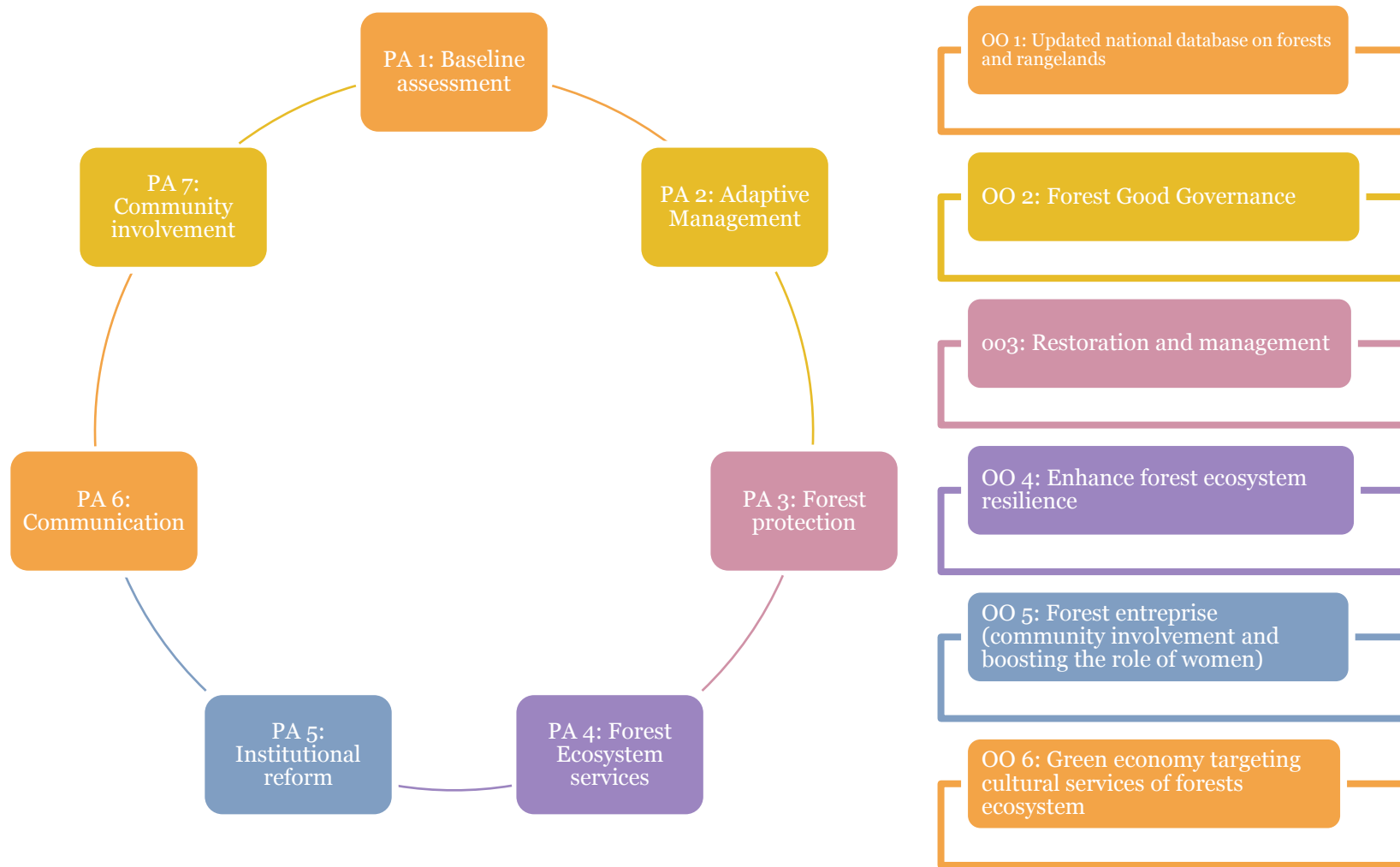
Based on DPSIR analysis, a list of priority actions was developed. These priority actions fall under either thematic line of activities or cross-cutting lines of activities. All the lines of activities will be based on applied research to link science to policy and use it as a tool for decision-making process. Following the identified priority actions, six operational objectives were developed (fig. 8).

Thematic lines of activities:

1. Assess and value the forest biodiversity and forest ecosystem services.
2. Develop and implement adaptive management programs for Lebanese ecosystems while tapping on resilience of ecosystems and ecological integrity.
3. Increase forest cover through the protection of existing forests, afforestation and reforestation of degraded ones and woodlands.
4. Establish forest enterprises through the motivation and support of small entrepreneurs in villages while encouraging green economy, women involvement and participatory approaches.

Cross-cutting line of activities:

1. Update the forestry laws and implement an institutional reform to ensure decentralization, accountability and transparency.
2. Synergize and mainstream forest ecosystems conservation and management into national policies and action plans.
3. Engage Lebanese as forest officers, scholars, youth, entrepreneurs, citizens, etc. in forest protection and management
4. Involve local community and civil societies in forest sector and empower women to leverage their status in the existing social dynamics at the level of the villages located in the vicinity of forests.



**Figure 8. The priority list of actions and the corresponding operational objectives (PA=Priority Action | OO=Operational Objectives)**

## **IV.2. Operational Objectives**

The operational objectives are sought in a logical framework on the basis of a set of priority actions needed to meet the mission. They are defined around the policy instruments agreed on among all national stakeholders.

### ***Operational Objective 1***

**Establish and update national data on forest and rangeland sector; promote research through the establishment of partnerships between the different sectors.**

A comprehensive national data about forest resources and rangelands need to be established and maintained as to promote evidence-based policies and management plans. Building up bridges between the government, academic institutions and research centers as well as civil society organizations towards supporting research based on demand and needs assessment sustained by the creation of a networked platform for the transfer of knowledge.

### ***Operational Objective 2***

**Strengthen the governance of forestland through setting up adapted mechanisms for direct responsiveness, efficient accountability and active communication.**

Forest governance and forest law enforcement are an important part of sustainable forest management in Lebanon. Activities will contribute to improved access to benefits for people by the prevention and decrease of forest crimes and infractions, and improved rural livelihoods and security for local communities and rural people dependent upon forests. Good governance practices will ensure better decision making for forest leaders and officials. Moreover, improved responsiveness of the public policies and institutions to the needs of the communities becomes possible. Accountability would be essential through establishing a platform for the private sector, citizens, civil society. Besides, communication will eventually increase access to information able to raise awareness and knowledge on forest sector and forest related issues.

### ***Operational objective 3***

**Set up sustainable management in forests; Establish restoration and rehabilitation plans in degraded lands to counteract soil erosion and desertification**

Developing and implementing sustainable forest management plans through a continuous and participatory process that involves local people in the decision making. Setting this program requires strengthening the coordination between different stakeholders and raising public awareness. Implementing the Pilot Master Plan (PMP) for Reforestation in Lebanon will help in identifying the potential areas for afforestation while defining

suitable species for planting. This is a prerequisite step towards the implementation of the National Afforestation/Reforestation Programme, along with developing and rehabilitating nurseries and encouraging applied research. Afterwards, proper management, effective maintenance and monitoring of the new plantations becomes mandatory.

#### ***Operational objective 4***

##### **Enhance ecosystem resilience in forestland to mitigate the impact of climate change and other natural hazards**

Maintaining and conserving existing forests as carbon sinks; reducing forest degradation through good management practices including effective management of vulnerable forest ecosystem, implementing Integrated Pest Management and adopting prevision, prevention and forest fire fighting measures. Within the framework of the already adopted strategy for fire management; this will result in a more resilient ecosystem.

#### ***Operational Objective 5***

##### **Supporting small enterprises through the development of value chains standards, for improved sustainable production of forests and rangelands value added goods.**

Initiating a national assessment on forage species, developing management plans for rangelands and pastures, and supporting local livelihood in villages while establishing effective system for controlled grazing.

Empowering small business related to forest and rangelands products for improving local livelihood conditions. Setting and promoting standards for value chains development of the forest goods (NWFPs and FPs). Introducing the concept of voluntary and compulsory sustainability standards to initiate certification for most of the forest ecosystem services (provisioning, supporting, regulating, and cultural services).

#### ***Operational objective 6***

##### **Launch and support green economic opportunities through the establishment of the needed infrastructure to improve the related services of forests and rangelands**

Setting platforms for promoting the forest related services in forest ecosystems and rangelands (e.g. ecotourism, responsible tourism and pastoral tourism). Focusing on conserving the environment, enhancing the quality of life for local communities, and improving the forest related and ecotourism products and services to become a successful operation leading to socio-economic benefits.

## Chapter V. Programs of Action

<b>Forest Governance</b>	
Operational Objective 1	<b>Establish and update national data on forest and rangeland sector; promote research through the establishment of partnerships between the different sectors</b>
1.1.	Update baseline assessment on all types of forests and rangelands
1.2.	Promote result oriented research based on demand and on identified needs of the forest sector
1.3.	Demarcation, classification and registration of forests and other wooded lands
Operational Objective 2	<b>Strengthen the governance of forestland through setting up adapted mechanisms for direct responsiveness, efficient accountability and active communication.</b>
2.1.	Develop and implement an action plan to strengthen institutional, technical and administrative public capacities in forest sector
2.2.	Update forest legislation to be aligned with national priorities, national strategies, policies and actions plans
2.3.	Establish a sustainable independent funding mechanism for the forest sector
2.4.	Develop a national communication strategy on forests and rangelands
<b>Ecosystem Functioning</b>	
Operational Objective 3	<b>Set up sustainable management in forests; Establish restoration and rehabilitation plans in degraded lands to counteract soil erosion and desertification</b>
3.1.	Develop and implement sustainable forest management principles
3.2.	Establish an effective network of forest trees nurseries at national level
3.3.	Implement the Pilot Master Plan (PMP) for Reforestation in Lebanon and the National Afforestation/Reforestation Programme
Operational Objective 4	<b>Enhance ecosystem resilience in forestland to mitigate the impact of climate change and other natural hazards</b>
4.1.	Implement a national program on Integrated Pest Management in forests
4.2.	Mitigate the effect of climate change on vulnerable forest ecosystems
4.3.	Ensure effective management in protected forests for biodiversity conservation
4.4.	Apply measures related to prevision , prevention and fire fighting in forests

### **Ecosystem Services**

Operational Objective 5	<b>Supporting small enterprises through the development of value chains standards, for sustainable production of forests and rangelands value added goods</b>
5.1.	Develop and apply national schemes on sustainable rangelands management
5.2.	Put in place a sustainable management plan for the development of the socio-economic values of Wood and NonWood Forest Products (NWFP)
5.3.	Develop an action plan to support small entrepreneurs on Wood and NWFP in rural areas and villages
Operational Objective 6	<b>Launch and support green economic opportunities through the establishment of the needed infrastructure to improve the related services of forests and rangelands</b>
6.1.	Set up a framework for the development of ecotourism activities in public and private forests
6.2.	Revive transhumance pastoral systems and bring in the pastoral tourism model

## Programs of Action

	Statement	Stakeholders	Potential Partners	Outcomes
Operational Objective 1	<b>Establish and update national data on forest and rangeland sector; promote research through the establishment of partnerships between the different sectors</b>			
Activity 1.1.	Update baseline assessment on all types of forests and rangelands	MoA MoE	NCSR LARI Universities FAO Funding agencies Municipalities Local community	Updated computerized database with a system for data management, maintenance and management
<i>Sub-activities</i>	1. Review and analysis of all forests and rangelands assessments, studies and national reports 2. Perform national inventories and surveys in forests and rangelands 3. Develop an integrated national monitoring program on forests and rangelands			
Activity 1.2.	Promote result oriented research based on demand and on identified needs of the forest sector	MOA MEHE Universities Research Centers	NCSR LARI Universities FAO Funding agencies	National Research Program revised on annual basis
<i>Sub-activities</i>	1. Develop a national research program on forest sector and rangelands: identify research topics based on sector priorities. 2. Promote partnership-based dialogue through creation of a network platform for the transfer of knowledge which includes representatives of the universities, technical colleges, other institutions and forest practitioners.			
Activity 1.3.	Demarcation, classification and registration of forests and other wooded lands	MoA, MoE, MoF, MoJ,	NCSR LARI	Forestlands delineated and officially registered



<i>Sub-activities</i>	1. Establish a temporary entity stipulated in Law No 558 for the demarcation of all public forests, and its activation. 2. Delineate and map the public forests followed by on ground validation 3. Register officially the forest lands in the real estate department of the Ministry of Finance 4. Develop the forest classes and rangelands types	MoD, MoPW&T, MoI &M	Forest Regional Centers Universities Local communities Experts	
Operational Objective 2	<b>Strengthen the governance of forestland through setting up adapted mechanisms for direct responsiveness, efficient accountability and active communication.</b>			
Activity 2.1.	Develop and implement an action plan to strengthen institutional, technical and administrative public capacities in forest sector	MoA CoM State of Council	Universities Experts Private sector	Institutional reform of RDNRD with strong administrative and technical capacities
<i>Sub-activities</i>	1. Review and assess the RDNRD administrative structure and human resources capacity 2. Develop and implement an action plan to reinforce the institutional, administrative and technical capacities as per the assessment 3. Restructure and empower RDNRD and the related regional departments to ensure the implementation and enforcement of all regulatory measures related to forests 4. Set up a framework for coordination based on the inter-ministerial committee (IMC) <sup>10</sup>	MoI MoSA MoJ		
Activity 2.2.	Update forest legislation to be aligned with national priorities, national strategies, policies and actions plans.	CoM MoA	Interdisciplinary and multi-sectoral committee of experts	New Code for forests
<i>Sub-activities</i>	1. Review and analyze existing legislations 2. Develop a draft updated law targeting the existing and emerging challenges based on the policy program instruments (i.e. EBM, gender balance, SFM)	MoF, MoJ MoD, NGOs NCSR LARI	Civil society NGOs Universities Local community	
Activity 2.3.	Establish a sustainable independent funding mechanism for the forest sector	MoF MoA	Regional Development Banks	Independent structure for a Sustainable funding mechanism

<sup>10</sup> The interministerial committee set for the 40 million tree program

<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. Review and assess existing funding mechanisms related to forest sector at national, regional and global level</li> <li>2. Promote forest partnerships based on endorsed conservation finance</li> <li>3. Issue respective laws to formalize and operationalize the “self-funding” mechanisms (collection of the forest revenues i.e. fees, taxes, management revenues) and adopt various partnership profiles in the forest sector</li> <li>4. Amend the related law and activate the Reforestation Fund in the Ministry of Agriculture<sup>11</sup></li> </ol>	MoJ	Experts Private sector	in place
Activity 2.4.	Develop a national communication strategy on forests and rangelands	MoA MoI Media MoE MEHE IMC Ministry of information MoFA	Universities NGOs Central and Regional departments (MoA) Advertising companies Schools National news Agency NNA Experts MoFA	Lebanese citizens connected virtually and in reality to the Lebanese forests
<i>Subactivities</i>	<ol style="list-style-type: none"> <li>1. Assess existing communication tool on forests in Lebanon and in the region</li> <li>2. Develop an action plan to generate and disseminate communication material for mass sensitization on specific topics related to the forest sector in the context of the Lebanese culture and social profiles</li> <li>3. Create an interactive platform for RDNRD staff and national stakeholders to connect with the international stakeholders and partners</li> <li>4. Design a portfolio for the 40 million forest trees program for fundraising</li> <li>5. Design and develop communication documents on forests in close cooperation with the Ministry of Education to integrate them in schools curricula</li> </ol>			
Operational Objective 3	<b>Set up sustainable management in forests; Establish restoration and rehabilitation plans in degraded lands to counteract soil erosion and desertification</b>			
Activity 3.1.	Develop and implement sustainable forest management principles	MoA MoE	Universities	Management systems in place for forests with sustainable

<sup>11</sup> Refer to the Forest Law of 1949

<i>Sub-activities</i>	1. set up the framework for sustainable forest management and implement pilot management plans 2. Design and put in place a participatory approach for the engagement of neighboring communities based on forest functions 3. Set in place an award system for best management practices in public and private forests.	MoI&M	NCSR LARI Municipalities NGOs Local communities Experts	management schemes
Activity 3.2. <i>Sub-activities</i>	Establish an effective network of forest trees nurseries 1. Assess the existing nurseries in terms of financial, administrative and technical capacity 2. Develop an action plan for the establishment of public nurseries in remote regions candidate for reforestation 3. Promote the implementation of micro-nurseries locally managed in the regions (operated by municipalities, schools..) 4. Organize training of trainers program on nurseries management from seeds to trees/from forest to forest and develop manuals for technicians. 5. Put in place a certification system for the chain of production from seeds to tree with good quality 6. Establish a central unit for seed storage, curing, maintenance and management	MoA RDNRD/Regional forest centers MoE MEHE Schools	Universities NGOs Nature Reserves Forest tree Nurseries FAO Municipalities CSOs Local communities Experts	A strong network of nurseries with highly competitive institutional, administrative, and technical capacities
Activity 3.3.	Implement the Pilot Master Plan (PMP) for Reforestation in Lebanon and the National Afforestation/Reforestation Programme	MoA RDNRD MoA regional Centers MoE Municipalities	Technical experts Universities Private sector and Development banks NGOs CSOs	Towards 50% of the implementation of the 40 million trees programme
<i>Sub-activities</i>	1. Develop reforestation protocols and maintenance guidelines for sustainable reforestation/afforestation activities 2. Identify key priority areas for reforestation and afforestation based on priority criteria, delineate them and perform surveys on communities preferences 3. Design and set partnership schemes with potential partners 4. Conduct reforestation activities on nationwide level based on endorsed partnerships and protocols			
Operational Objective 4	<b>Enhance ecosystem resilience in forestland to mitigate the impact of climate change and other natural hazards</b>			

Activity 4.1.	Implement a national program on Integrated Pest Management in forests	MoA (RDNRD) MoA (Regional Service centers) MOE Research Centers	Municipalities Universities Research centers NGOs Local Communities Experts	Ecosystem health of forest well managed with 'near-zero' pest infestation
<i>Sub-activities</i>	1. Develop a monitoring program on forest ecosystem health 2. Develop an action plan to identify alien and invasive species and apply preventive and corrective measures 3. Develop a management plan for disease and pest control in forests			
Activity 4.2.	Mitigate the effect of climate change on vulnerable forest ecosystems	MoA (RDNRD) MoA Regional Service centers MOE	Municipalities Universities Research centers Experts Municipalities	Improved mitigation practices in forest management
<i>Sub=activities</i>	1. Assess the effect of climate change on forest ecosystem health 2. Develop an action plan for "adaptation to climate change and mitigation measures for vulnerable species" in forest management plans 3. Develop and implement a Measurement, Reporting and Verification (MRV) procedure for existing and newly planted reforested areas to monitor the carbon sink			
Activity 4.3.	Ensure effective management in protected forests for biodiversity conservation	MoA (RDNRD) MoA Regional Service Centers MoE	Municipalities Universities Research Centers NGOs Municipalities Experts	Biodiversity better conserved
<i>Subactivities</i>	1. Guarantee multiplication of endangered species through regeneration activities within protected forest. 2. Collect, conserve and disseminate traditional and local knowledge, innovations and practices related to biodiversity conservation.			
Activity 4.4.	Apply measures related to prevision, prevention and fire fighting in forests	MoA (RDNRD) MoA Regional Service centers MoE MoD MoI&M (Municipalities & civil defense)	UNDP Universities Research centers NGOs Local Communities Civil defense Experts	Effective Mechanisms for emergency response measures on forest fires

<i>Subactivities</i>	<ol style="list-style-type: none"> <li>1. Establish a coordination unit and operationalize mechanisms on forest fire prevention</li> <li>2. Design and adopt a fire risk model to decrease the fire and empower mechanisms of the response measures</li> <li>3. Apply best practices of sylvo-pastoral systems to reduce fire risk in private and public forest land.</li> <li>4. Enhance forest fire fighting measures, infrastructure, capacity building and training</li> </ol>			
Operational Objective 5	<b>Supporting small enterprises through the development of value chains standards, for sustainable production of forests and rangelands value added goods</b>			
Activity 5.1.	Develop and apply national schemes on sustainable rangelands management	MoA (RDNRD) MoA Regional Service Centers MoE Municipalities	Municipalities Universities Research Centers NGOs Local Communities Experts	Rangelands sustainably managed with strong community of practices
<i>Subactivities</i>	<ol style="list-style-type: none"> <li>1. Stocktaking on historical management of rangelands in Lebanon and the region.</li> <li>2. Baseline assessment on the ecology and forages species, existing management system of rangelands, their carrying capacity and the socio-economic dynamics of the local communities and shepherds.</li> <li>3. Review the regulatory framework governing rangelands management, identify gaps and propose amendments, administrative system to monitor the implementation of laws, registry, shepherds livelihood, etc.</li> <li>4. Develop a sustainable management plan and revive the agro-sylvo-pastoral system.</li> <li>5. Support job creation through the establishment of transhumance corridors and pastoral related activities.</li> </ol>			
Activity 5.2.	Put in place a sustainable management plan for the development of the socio-economic values of Wood and NWFP	MoA (RDNRD) MoA Regional Service Centers	Universities Research Centers NGOs	Sustainable Management Schemes for wood and NWFPs put in place

	<ol style="list-style-type: none"> <li>1. Stocktaking all existing studies and reports on all types of Wood and NWFP</li> <li>2. Assess the physiological and biological characteristics of Wood and NWFP MAPs and their area carrying capacities</li> <li>3. Assess the socio-economic values of Wood and NWFP</li> <li>4. Train the producers/small entrepreneurs on best management practices for better production and quality product</li> <li>5. Develop marketing strategies to support the local community in promoting Wood and NWFP</li> </ol>	MoE	Local Communities Experts Municipalities	Database fed with MAPs best management practices
Activity 5.3.	Develop an action plan to support small entrepreneurs on Wood and NWFP in rural areas and villages	MoA (RDNRD) MoA Regional Service Centers MoE	Universities Research centers NGOs Local communities Experts Banks Municipalities	One National Lebanese brand for NWFP promoted and marketed in national, regional and International market Forum
<i>Subactivities</i>	<ol style="list-style-type: none"> <li>1. Develop and set the basis for Wood and NWFP value chains</li> <li>2. Set guidelines and train small entrepreneurs on the production and processing of Wood and NWFP</li> <li>3. Develop promotion and marketing strategies to support the local communities in promoting their forest products and services while developing a specific brand for Lebanese forests and rangelands with international standards</li> <li>4. Launch and set initiatives for the provision of loans through agreements with banks for small forest related businesses.</li> </ol>			
Operational Objective 6	<b>Launch and support green economic opportunities through the establishment of the needed infrastructure to improve the related services of forest and rangelands</b>			
Activity 6.1.	Set up a framework for the development of ecotourism activities in public and private forests	MoA (RDNRD)	Municipalities Universities	Establish a network of managed forests for tourism and

<i>Subactivities</i>	<ol style="list-style-type: none"> <li>1. Assess the potential for cultural ecosystem services in public and private forests (i.e. recreational and ecotourism)</li> <li>2. Develop technical guidelines for establishing ecotourism activities on public and private forestlands</li> <li>3. Building Capacities of forest guards and neighboring communities on forest related services</li> <li>4. Assess and revive traditional activities related directly or indirectly to forest in villages with women leadership</li> <li>5. Design a program for the promotion and marketing of the forest</li> </ol>	MoA Regional Service Centres MOE MoT MoInformation	NGOs Eco-tour operators Technical experts	ecotourism
Activity 6.2.	Revive transhumance pastoral systems and bring in the pastoral tourism model	MoA (RDNRD)	Universities	A solid community of practices on pastoralism and pastoral tourism in place
<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. Redraw and map the transhumant path of the shepherds</li> <li>2. Develop and implement a Protocol of collaboration between municipalities and forest services</li> <li>3. Introduce pastoral tourism to leverage the livelihood of shepherd</li> </ol>	MoA Regional departments MOE MoI&M	Research Centers NGOs Shepherds Local Communities Technical experts Municipalities	

## Chapter VI. Budget and Calendar

	Statement	TIME PLAN Years										Implementation Period (Months)	Budget (\$)	
		1	2	3	4	5	6	7	8	9	10			
Operational objective 1	<b>Establish and update national data on forest and rangeland sector; promote research through the establishment of partnerships between the different sectors</b>													
Activity 1.1.	Update baseline assessment on all types of forests and rangelands												60 M	<b>435 000</b>
<i>Sub-activities</i>	1. Review and analysis of all forests and rangelands assessments, studies and national reports												10 M	5 000
	2. Perform national inventories and surveys in forests and rangelands												45 M	400 000
	3. Develop an integrated national monitoring program on forests and rangelands <sup>12</sup>												5 M	30 000
Activity 1.2.	Promote result oriented research based on demand and on identified needs of the forest sector												20 M	<b>130 000</b>
<i>Sub-activities</i>	1. Develop a national research program on forest sector and rangelands: identify research topics based on sector priorities.												10 M	30 000
	2. Promote partnership-based dialogue through creation of a network platform for the transfer of knowledge which includes representatives of the universities, technical colleges, other institutions and forest practitioners.												72 M	100 000

<sup>12</sup> This is a combined component with the forest classes and the objectives of the management types of forest and rangelands.



Activity 1.3.	Demarcation, classification and registration of forest and other wooded lands																			72 M	<b>330 000</b>	
<i>Sub-activities</i>	1. Establish a temporary entity stipulated in Law No 558 for the demarcation of all public forests, and its activation.																			6 M	10 000	
	2. Delineate and map the public forests followed by on ground validation																			48 M	250 000	
	3. Register officially the forest lands in the real estate department of the Ministry of Finance <sup>13</sup>																			18 M	20 000	
	4. Develop the forest classes and rangelands types																			12 M	50 000	
<b>Operational Objective 2</b>	<b>Strengthen the governance of forestland through setting up adapted mechanisms for direct responsiveness, efficient accountability and active communication.</b>																					
Activity 2.1.	Develop and implement an action plan to strengthen institutional, technical and administrative public capacities in forest sector																			48 M	<b>1 000 000</b>	
<i>Sub-activities</i>	1. Review and assess the RDNRD administrative structure and human resources capacity																			6 M	30 000	
	2. Develop and implement an action plan to reinforce the institutional, administrative and technical capacities as per the assessment																			12 M	600 000	
	3. Restructure and empower RDNRD and the related regional departments to ensure the implementation and enforcement of all regulatory measures related to forests																			80M	370 000	
	4. Set up a framework for coordination based on the inter-ministerial committee(IMC)																			6 M	-----	
Activity 2.2.	Update forest legislation to be aligned with national priorities, national strategies, policies and actions plans.																			36 M	<b>85 000</b>	
<i>Sub-activities</i>	1. Review and analyze existing legislation																			10 M	40 000	

<sup>13</sup> Development of forest classes and the classification of forest land will be part of other activities (Update of forest databases/research and management plans)



	5. Design and develop communication documents on forests in close cooperation with the Ministry of Education to integrate them in schools curricula																		24 M	75 000
<b>Operational Objective 3</b>	<b>Set up sustainable management in forests; Establish restoration and rehabilitation plans in degraded lands to counteract soil erosion and desertification</b>																			
Activity 3.1.	Develop and implement sustainable forest management principles																		60 M	<b>310 000</b>
<i>Sub-activities</i>	1. set up the framework for sustainable forest management and implement pilot management plans																		12 M	210 000
	2. Design and put in place a participatory approach for the engagement of neighboring communities based on forest functions																		12 M	50 000
	3. Set in place an award system for best management practices in public and private forests.																		5 M	50 000
Activity 3.2.	Establish an effective network of forest trees nurseries																		84 M	<b>275 000</b>
<i>Subactivities</i>	1. Assess the existing nurseries in terms of financial, administrative and technical capacity																		6 M	20 000
	2. Develop an action plan for the establishment of public nurseries in remote regions candidate for reforestation																		48 M	30 000
	3. Promote the implementation of micro-nurseries locally managed in the regions (operated by municipalities, schools....)																		14 M	50 000
	4. Organize training of trainers program on nurseries management from seeds to trees/from forest to forest and develop manuals for technicians.																		30 M	50 000
	5. Put in place a certification system for the chain of production from seeds to tree with good quality																		18 M	25 000
	6. Establish a central unit for seed storage, curing, maintenance and management																		56 M	100 000
Activity 3.3.	Implement the Pilot Master Plan (PMP) for Reforestation in Lebanon and the National Afforestation/Reforestation Programme																		120 M	<b>120 375 000</b>

<i>Sub-activities</i>	1. Develop reforestation protocols and maintenance guidelines for sustainable reforestation/afforestation activities																	12 M	50 000	
	2. Identify key priority areas for reforestation and afforestation based on priority criteria, delineate them and perform surveys on communities preferences																		30 M	300 000
	3. Design and set partnership schemes with potential partners																		30 M	25 000
	4. Conduct reforestation activities on nationwide level based on endorsed partnerships and protocols																		30 M	120 000 000
<b>Operational Objective 4</b>	<b>Enhance ecosystem resilience in forestland to mitigate the impact of climate change and other natural hazards</b>																			
<i>Activity 4.1.</i>	Implement a national program on Integrated Pest Management in forests																		60 M	<b>900 000</b>
<i>Sub-activities</i>	1. Develop a monitoring program on forest ecosystem health																		30 M	100 000
	2. Develop an action plan to identify alien and invasive species and apply preventive and corrective measures																		18 M	350 000
	3. Develop a management plan for disease and pest control in forests																		18 M	450 000
<i>Activity 4.2.</i>	Mitigate the effect of climate change on vulnerable forest ecosystems																		72 M	<b>525 000</b>
<i>Sub-activities</i>	1. Assess the effect of climate change on forest ecosystem health																		30 M	200 000
	2. Develop an action plan for adaptation to climate change and mitigation measures for vulnerable species in forest management plans																		48 M	100 000
	3. Develop and implement a Measurement, Reporting and Verification (MRV) procedure for existing and newly planted reforested areas to monitor the carbon sink																		30 M	225 000
<i>Activity 4.3.</i>	Ensure effective management in protected forests for biodiversity conservation																		60 M	<b>15 090 000</b>



Activity 5.2.	Put in place a sustainable management plan for the development of the socio-economic values of Wood and NWFP																	48 M	<b>325 000</b>		
<i>Sub-activities</i>	1. Stocktaking all existing studies and reports on all types of Wood and NWFP																		20 M	60 000	
	2. Assess the physiological and biological characteristics of Wood and NWFP MAPs and their areas carrying capacities																		24 M	45 000	
	3. Assess the socio-economic values of Wood and NWFP																		24 M	50 000	
	4. Train the producers/small entrepreneurs on best management practices for better production and quality product																		36 M	100 000	
	5. Develop marketing strategies to support the local community in promoting Wood and NWFP																		40 M	70 000	
Activity 5.3.	Develop an action plan to support small entrepreneurs on Wood and NWFP in rural areas and villages																		100 M	<b>785 000</b>	
<i>Sub-activities</i>	1. Develop and set the basis for Wood and NWFP value chains																		24 M	160 000	
	2. Set guidelines and train small entrepreneurs on the production and processing of Wood and NWFP																		60 M	250 000	
	3. Develop promotion and marketing strategies to support the local communities in promoting their forest products and services while developing a specific brand for Lebanese forest and rangelands with international standards																		30 M	125 000	
	4. Launch and set initiatives for the provision of loans through agreements with banks for small forest related businesses.																		24 M	250 000	
Operational Objective 6	<b>Launch and support green economic opportunities through the establishment of the needed infrastructure to improve the related services of forest and rangelands</b>																				
Activity 6.1.	Set up a framework for the development of ecotourism activities in public and private forests																		24 M	<b>345 000</b>	
<i>Sub-activities</i>	1. Assess the potential for cultural ecosystem services in public and private forests (i.e. recreational and eco-tourism)																		12 M	30 000	
	2. Develop technical guidelines for establishing ecotourism activities on public and private forestlands																		24 M	45 000	
	3. Building Capacities of forest guards and neighboring communities on forest related services																		24 M	70 000	

	4. Assess and revive traditional activities related directly or indirectly to forest in villages with women leadership										24 M	100 000
	5. Design a program for the promotion and marketing of the forest										18 M	100 000
Activity 6.2.	Revive transhumance pastoral systems and bring in the pastoral tourism model										48 M	<b>220 000</b>
<i>Sub-activities</i>	1. Redraw and map the transhumant path of the shepherds										36 M	70 000
	2. Develop and implement a Protocol of collaboration between municipalities and forest services										36 M	50 000
	3. Introduce pastoral tourism to leverage the livelihood of shepherd										36 M	100 000
<b>Total</b>												<b>142,360,000 \$</b>

## Chapter VII. Follow Up System

### VII. A. Indicators and Targets

	Statement	Indicators	Targets
<b>Operational objective 1</b>	<b>Establish and update national data on forest and rangeland sector; promote research through the establishment of partnerships between the different sectors</b>		
Activity 1.1.	Update baseline assessment on all types of forests and rangelands		A comprehensive National baseline assessment by 2020
<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. Review and analysis of all forests and rangelands assessments, studies and national reports</li> <li>2. Perform national inventories and surveys in forests and rangelands</li> <li>3. Develop an integrated national monitoring program on forests and rangelands</li> </ol>	<ul style="list-style-type: none"> <li>- Operational and inter-operable database</li> <li>- 1 Inventory data for forests</li> <li>- 1 Inventory data for rangelands</li> <li>- No. of identified keystone/indicator species</li> <li>- Guiding Principles for Monitoring</li> <li>- Integrated Monitoring Plan for forest</li> <li>- Integrated Monitoring Plan for rangelands</li> </ul>	
Activity 1.2.	Promote result oriented research based on demand and on identified needs of the forest sector		A National research program on Forest by 2018
<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. Develop a national research program on forest sector and rangelands: identify research topics based on sector priorities.</li> <li>2. Promote partnership-based dialogue through creation of a network platform for the transfer of knowledge which includes representatives of the universities, technical colleges, other institutions and forest practitioners.</li> </ol>	<ul style="list-style-type: none"> <li>- 2 per year National research agenda priority on forest and rangelands</li> <li>- No. of meetings per year</li> </ul>	



Activity 1.3.	Demarcation, classification and registration of forests and other wooded lands		Delineated map of public forests and public lands suitable to reforestation by 2018
<i>Subactivities</i>	<ol style="list-style-type: none"> <li>1. Establish a temporary entity stipulated in Law No 558 for the demarcation of all public forests, and its activation.</li> <li>2. Delineate and map the public forests followed by on ground validation</li> <li>3. Register officially the forest lands in the real estate department of the Ministry of Finance</li> <li>4. Develop the forest classes and rangelands types</li> </ol>	<ul style="list-style-type: none"> <li>- ToR of the entity are finalized and approved</li> <li>- 1 entity for the demarcation and registration public forest land</li> <li>- No. of field visit for ground validation</li> <li>- areas of public lands geo-referenced</li> <li>- Map of the public forest is completed</li> <li>- A guideline for forest demarcation is created</li> <li>- A List of Public Forests is officially registered</li> <li>- Forest Classes and types are finalized and adopted</li> </ul>	
<b>Operational Objective 2</b>	<b>Strengthen the governance of forestland through setting up adapted mechanisms for direct responsiveness, efficient accountability and active communication.</b>		
Activity 2.1.	Develop and implement an action plan to strengthen institutional, technical and administrative public capacities in forest sector		Public institutional, technical and administrative capacities are strengthened and restructured in 2020 5 types of training packages for the capacity development of staff
<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. Review and assess the RDNRD administrative structure and human resources capacity</li> <li>2. Develop and implement an action plan to reinforce the institutional, administrative and technical capacities as per the assessment</li> <li>3. Restructure and empower RDNRD and the related regional departments to ensure the implementation and enforcement of all regulatory measures related to forests</li> <li>4. Set up a framework for coordination based on the inter-ministerial committee (IMC)<sup>15</sup></li> </ol>	<ul style="list-style-type: none"> <li>- 1 report on assessment needs for the RDNRD structure</li> <li>- action plan is finalized for the RDNRD</li> <li>- 50 trainings sessions</li> <li>- 250 trained staff</li> <li>- TORs upgraded</li> <li>- 45 forest centers are equipped</li> <li>- 2 meetings per year for inter-ministerial committee</li> </ul>	

<sup>15</sup> The interministerial committee set for the 40 million tree program

Activity 2.2.	Update forest legislation to be aligned with national priorities, national strategies, policies and actions plans.		One Forest code is put in place by 2018
<i>Sub-activities</i>	1. Review and analyze existing legislations 2. Develop a draft updated law targeting the existing and emerging challenges based on the policy program instruments (i.e. EBM, gender balance, SFM)	- A Comprehensive report is published - 1 draft of updated forest code	
Activity 2.3.	Establish a sustainable independent funding mechanism for the forest sector		A Financing Mechanism for the forest Sector is endorsed and put in place in 2020 100 Partnerships established between MoA and different stakeholders (MoF, Municipalities, NGO's, Donors)
<i>Sub-activities</i>	1. Review and assess existing funding mechanisms related to forest sector at national, regional and global level 2. Promote forest partnerships based on endorsed conservation finance 3. Issue respective laws to formalize and operationalize the “self-funding” mechanisms (collection of the forest revenues i.e. fees, taxes, management revenues) and adopt various partnership profiles in the forest sector 4. Amend the related law and activate the Reforestation Fund in the Ministry of Agriculture <sup>16</sup>	- Assessment Report on existing financial mechanisms for the forest sector - Proposal for potential Models of independent self-funding mechanism -TORs for financing system are drafted And document is endorsed -No of self- funding decrees, regulations issued - TORs for the Reforestation Fund are reviewed and upgraded - The reforestation fund is put in place	
Activity 2.4.	Develop a national communication strategy on forests and rangelands		One website is created and active and a communication unit is established in 2017

<sup>16</sup> Refer to the Forest Law of 1949

<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. Assess existing communication tool on forests in Lebanon and in the region</li> <li>2. Develop an action plan to generate and disseminate communication material for mass sensitization on specific topics related to the forest sector in the context of the Lebanese culture and social profiles</li> <li>3. Create an interactive platform for RDNRD staff and national stakeholders to connect with the international stakeholders and partners</li> <li>4. Design a portfolio for the 40 million forest trees program for fundraising</li> <li>5. Design and develop communication documents on forests in close cooperation with the Ministry of Education to integrate them in schools curricula</li> </ol>	<ul style="list-style-type: none"> <li>- A Report on communication strategy is completed</li> <li>- 1 Communication Plan is put in action</li> <li>- functional platform is in place</li> </ul>	A comprehensive portfolio of the 40 Million Forest Tree program is prepared and promoted or funding purposes
<b>Operational Objective 3</b>	<b>Set up sustainable management in forests; Establish restoration and rehabilitation plans in degraded lands to counteract soil erosion and desertification</b>		
Activity 3.1.	Develop and implement sustainable forest management principles		50% of public Forests are sustainably managed in 2025 30% of private Forests are sustainably managed in 2025
<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. set up the framework for sustainable forest management and implement pilot management plans</li> <li>2. Design and put in place a participatory approach for the engagement of neighboring communities based on forest functions</li> <li>3. Set in place an award system for best management practices in public and private forests.</li> </ol>	<ul style="list-style-type: none"> <li>- No. Management plans implemented for public forests</li> <li>- No.of Management plans implemented for private forests</li> <li>-No of MOU signed with Municipalities</li> <li>- 5 Awards Events are created ( 1 event every 2 years)</li> </ul>	
Activity 3.2.	Establish an effective network of forest trees nurseries		A Forest tree seed centre is created Nurseries are able to produce two million high quality seedlings per year by 2020

<i>Subactivities</i>	<ol style="list-style-type: none"> <li>1. Assess the existing nurseries in terms of financial, administrative and technical capacity</li> <li>2. Develop an action plan for the establishment of public nurseries in remote regions candidate for reforestation</li> <li>3. Promote the implementation of micro-nurseries locally managed in the regions (operated by municipalities, schools..)</li> <li>4. Organize training of trainers program on nurseries management from seeds to trees/from forest to forest and develop manuals for technicians.</li> <li>5. Put in place a certification system for the chain of production from seeds to tree with good quality</li> <li>6. Establish a central unit for seed storage, curing, maintenance and management</li> </ol>	<ul style="list-style-type: none"> <li>- 1 Proposal on the mitigation measures for more efficient production/management of the public nurseries</li> <li>- 5 new public nurseries are established and equipped</li> <li>- 10 Million seedlings are produced in 5 years</li> <li>- Technical Guidelines for production and management of forest nurseries</li> <li>- 15 public nurseries are in compliance to the guidelines and improved their management (existing and newly established).</li> <li>- No. of trainings for nurseries staff</li> <li>- Certification guidelines are issued</li> <li>- Registration system is put in place</li> <li>- 50 sites are selected, georeferenced and data based for high seeds</li> <li>- A list of forest seeds species sources is established</li> <li>- A management system for forest seeds center is put in place</li> </ul>	
Activity 3.3.	Implement the Pilot Master Plan (PMP) for Reforestation in Lebanon and the National Afforestation/Reforestation Programme		20000 hectares of public lands are reforested
<i>Subactivities</i>	<ol style="list-style-type: none"> <li>1. Develop reforestation protocols and maintenance guidelines for sustainable reforestation/afforestation activities</li> <li>2. Identify key priority areas for reforestation and afforestation based on priority criteria, delineate them and perform surveys on communities preferences</li> <li>3. Design and set partnership schemes with potential partners</li> <li>4. Conduct reforestation activities on nationwide level based on endorsed partnerships and protocols</li> </ol>	<ul style="list-style-type: none"> <li>- Reforestation protocols are established and adopted</li> <li>- 20000 Hectares are selected for reforestation</li> <li>- 150 Villages are surveyed for community preferences</li> <li>- Partnerships are established</li> <li>-150 Municipalities are engaged in reforestation</li> </ul>	
<b>Operational Objective 4</b>	<b>Enhance ecosystem resilience in forestland to mitigate the impact of climate change and other natural hazards</b>		

Activity 4.1.	Implement a national program on Integrated Pest Management in forests		50% of public Forest are monitored and protected from pests and diseases outbreaks
<i>Sub-activities</i>	1. Develop a monitoring program on forest ecosystem health 2. Develop an action plan to identify alien and invasive species and apply preventive and corrective measures 3. Develop a management plan for disease and pest control in forests	- list of plants vulnerable to pests and diseases - Pest and disease management plans are issued - - a national strategy is issued and endorsed - a list of invasive species is listed - Prepare a list of alien species	
Activity 4.2.	Mitigate the effect of climate change on vulnerable forest ecosystems		A protocol for MRV is developed
<i>Sub-activities</i>	1. Assess the effect of climate change on forest ecosystem health 2. Develop an action plan for “adaptation to climate change and mitigation measures for vulnerable species” in forest management plans 3. Develop and implement a Measurement, Reporting and Verification (MRV) procedure for existing and newly planted reforested areas to monitor the carbon sink	- 1 list of priority species vulnerable to climate change - A monitoring system is implemented -1000 ha of forests are protected through mitigation measures -10000 ha of planted and existing forests are monitored	
Activity 4.3.	Ensure effective management in protected forests for biodiversity conservation		
<i>Subactivities</i>	1. Guarantee multiplication of endangered species through regeneration activities within protected forest. 2. Collect, conserve and disseminate traditional and local knowledge, innovations and practices related to biodiversity conservation.	- 5000 ha are planted with endangered species - 100 awareness session are implemented	
<i>Activity 4.4.</i>	Apply measures related to prevision, prevention and fire fighting in forests		30% decrease in incidence of forest fires yearly
<i>Subactivities</i>	1. Establish a coordination unit and operationalize mechanisms on forest fire prevention 2. Design and adopt a fire risk model to decrease the fire and empower mechanisms of the response measures 3. Apply best practices of sylvo-pastoral systems to reduce fire risk in private and public forest land. 4. Enhance forest fire fighting measures, infrastructure, capacity building and training	-2 meetings per year are held -10 000 ha are protected -1 fire risk model is developed and operational - 30% of fire ignitions are reduced -report on best practice is generated  - 1500 ha are protected using sylvopastoral practices	

<b>Operational Objective 5</b>	<b>Supporting small enterprises through the development of value chains standards, for sustainable production of forests and rangelands value added goods</b>		
Activity 5.1.	Develop and apply national schemes on sustainable rangelands management		Assessment of rangelands Management plan for rangelands is developed
<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. Stocktaking on historical management of rangelands in Lebanon and the region.</li> <li>2. Baseline assessment on the ecology and forages species, existing management system of rangelands, their carrying capacity and the socio-economic dynamics of the local communities and shepherds.</li> <li>3. Review the regulatory framework governing rangelands management, identify gaps and propose amendments, administrative system to monitor the implementation of laws, registry, shepherds livelihood, etc.</li> <li>4. Develop a sustainable management plan and revive the agro-sylvo-pastoral system.</li> <li>5. Support job creation through the establishment of transhumance corridors and pastoral related activities.</li> </ol>	<ul style="list-style-type: none"> <li>- Comprehensive Report on management of Rangelands</li> <li>- No of heads are assessed and registered</li> <li>- List of forage species is developed</li> <li>- No. of Ecological maps of rangelands</li> <li>- No.MOU/Partnerships between Government, Farmers and Shepherds</li> <li>- Review report on existing laws</li> <li>- 1 map is created for rangelands</li> <li>- Monitoring guidelines are developed for grazing</li> <li>- No jobs created</li> </ul>	
Activity 5.2.	Put in place a sustainable management plan for the development of the socio-economic values of Wood and NWFP		10% of forest economic value is ensured by MAPS and melliferous plants in 2025
<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. Stocktaking all existing studies and reports on all types of Wood and NWFP</li> <li>2. Assess the physiological and biological characteristics of Wood and NWFP MAPs and their area carrying capacities</li> <li>3. Assess the socio-economic values of Wood and NWFP</li> <li>4. Train the producers/small entrepreneurs on best management practices for better production and quality product</li> <li>5. Develop marketing strategies to support the local community in promoting Wood and NWFP</li> </ol>	<ul style="list-style-type: none"> <li>- Maps of the ecological and socio-economic dynamics of the NWFPs</li> <li>- 20% Increase in honey production</li> <li>- 150 sessions are completed</li> <li>-No. of persons are trained</li> <li>- 10% Increase in MAPs and Melliferous plants population</li> <li>- 20 events to participate</li> <li>- 40 community groups are participating</li> <li>-1 brand is adopted for forest products</li> </ul>	
Activity 5.3.	Develop an action plan to support small entrepreneurs on Wood and NWFP in rural areas and villages		5 Value chains are developed in 2020 20% increase in income generation from forests in 2025

Sub-activities	<ol style="list-style-type: none"> <li>1. Develop and set the basis for Wood and NWFP value chains</li> <li>2. Set guidelines and train small entrepreneurs on the production and processing of Wood and NWFP</li> <li>3. Develop promotion and marketing strategies to support the local communities in promoting their forest products and services while developing a specific brand for Lebanese forests and rangelands with international standards</li> <li>4. Launch and set initiatives for the provision of loans through agreements with banks for small forest related businesses.</li> </ol>	<ul style="list-style-type: none"> <li>- 250 small enterprises on Wood and NWFPs are established</li> <li>- 50 women and youth based businesses are established from forest services</li> <li>- 150 sessions are completed</li> <li>- 10000 persons are trained on the Forest goods and services production chain</li> <li>- Guidelines for Value chains production are developed</li> <li>- 40 community groups are participating</li> <li>- 1 brand is adopted for forest products</li> <li>- 500 persons have a facilitated access to loans</li> </ul>	
<b>Operational Objective 6</b>	<b>Launch and support green economic opportunities through the establishment of the needed infrastructure to improve the related services of forest and rangelands</b>		
Activity 6.1.	Set up a framework for the development of ecotourism activities in public and private forests		10% increase income generated from forests ecotourism activities Map of forest with highly valued ecosystem services
<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. Assess the potential for cultural ecosystem services in public and private forests (i.e. recreational and eco-tourism)</li> <li>2. Develop technical guidelines for establishing ecotourism activities on public and private forestlands</li> <li>3. Building Capacities of forest guards and neighboring communities on forest related services</li> <li>4. Assess and revive traditional activities related directly or indirectly to forest in villages with women leadership</li> <li>5. Design a program for the promotion and marketing of the forest</li> </ol>	<ul style="list-style-type: none"> <li>- Assessment Report is completed for the services</li> <li>- Guidebooks on forest ecosystem services</li> <li>- No. of trainings days on management of forest services</li> <li>-</li> <li>- No. of women led initiatives are created</li> <li>- 1 brand is created</li> <li>- 5 promotional campaigns are created</li> </ul>	
Activity 6.2.	Revive transhumance pastoral systems and bring in the pastoral tourism model		10 % increase in Revenue of Shepherds

<i>Sub-activities</i>	<ol style="list-style-type: none"> <li>1. Redraw and map the transhumant path of the shepherds</li> <li>2. Develop and implement a Protocol of collaboration between municipalities and forest services</li> <li>3. Introduce pastoral tourism to leverage the livelihood of shepherd</li> </ol>	<ul style="list-style-type: none"> <li>- Maps of pastoral trails/transects are generated</li> <li>- No km of corridor is traced</li> <li>- No. of new jobs created in villages related to pastoral tourism</li> <li>- 50 municipalities are engaged</li> <li>- 50 MoU are signed and completed</li> <li>- 1 template for MOU on Transhumance corridor is endorsed</li> <li>-No. of new jobs in villages related to pastoral tourism</li> <li>- 20 organized journey on the pastoral trails</li> </ul>	
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## **VII. B. Recommendations**

The development of the National forest Program represents an important milestone in the history of the forests in Lebanon. The success of the document lies in its adequate implementation and the achievements made and measured over the 10 years span.

The realization of the program in all its activities, objectives, mission and vision compels the creation of an enabling environment for its completion and success. The engagement of the Ministry of Agriculture into an open dialogue with a wide variety of Stakeholders and the integration of more sectors of direct or indirect interest is Mandatory. A multi-sectoral approach will eventually provide support, endorsement and will eventually shorten the latent time for achievements.

Besides, the National forest Program will be able to uplift the forest sector in Lebanon to a more socio-economic rural development program. though ambitious, the program is realistic, needed and realizable. However, important normative measures are required to sustain its achievement. These are of political, administrative, managerial, legal, technical and communicative nature. Recommendations for successful implementation and achievement of the targets of the National forest Program would eventually entail:

- A political commitment is the guarantee for the success of the Lebanese NFP creating a favoring and enabling environment to complete the milestones as prerequisites.
- The review of the RDNRD structure and the expansion of its mandate and infrastructure are essential to the implementation of the NFP in the proposed time achieving its forecasted outputs
- The active coordination and the engagement of other public administration and the private sector is an important milestone for the responsiveness of the program to the challenges.
- Effective coordination and communication between the public entities is an important milestone for contributing to the integrated multi-sectoral approach the Program is aiming for.
- The engagement of the local communities is necessary to ensure the adoption and the support to the NFP in its identified terms of realization. However, the integration of the social dimension is only possible provided the responsible public entity engage in effective and constructive two way communication with the stakeholders and the beneficiaries.
- The communication on the forest and the emerging challenges requires an important investment in changing the mindset of the nationals through the dissemination of positive but engaging message about their contribution to the sustainability of the forest resources
- Effective, constructive and positive communication is essential and mandatory to promote the forests, engage in dialogue, increase awareness and knowledge about the sector and its related ones.
- The engagement and commitment of the international and national donors in supporting the activities is essential and supports its successful implementation

## References

- Abi-Saleh B., Nazih N., Hanna R., Safi N., Tohme H., 1996. Etude de la Diversité Biologique du Liban ; Vol. 3. MOA/PNUE, Beyrouth.
- Al-Shouf Cedar Nature Reserve/ GTZ, 2009, Shouf Biosphere Reserve Ecotourism Strategy “Restoration of income generation affected by the war to support conservation of Shouf Biosphere Reserve”
- Asmar F., 2011, Country Pasture/Forage resource profile, Lebanon.
- BC Ministry of Forests and Range, Wildfire management Branch, 2009, Climate change and fire management, research strategy.
- Croitoru L., Liagre L., 2013. Contribution of forests to a green economy in the Middle East and North Africa. GIZ Project on Adapting change in the MENA region, CPMF/Silva Mediterranean, Algeria.
- Ecole Nationale du Génie Rural des Eaux et des Forêts, Conseil de l’Environnement – Kobayat,1998, Proposition d’aménagement durable de la forêt de Kobayat au Liban.
- ELARD (Earth Link and Advanced Resources Development), 2010. Climate Risks, Vulnerability and Adaptation Assessment. Final Report. UNDP/MOE, Beirut.
- FAO, 2005, Global Forest Resources Assessment 2005 – Progress towards Sustainable Forest Management.
- FAO, 2009, Guidelines for Good Forestry and Range Practices in Arid and Semi-Arid zones of the Near East, working paper, Cairo.
- FAO, 2010, Global Forest Resources Assessment 2010 – Country Report.
- FAO, Forest department, 2010, FRA (Forest Resource Assessment), 2010. Global Forest Resource Assessment-Country Report Lebanon.
- FAO (Food and Agriculture Organization), 2010. Forests and Climate Change in the Near East Region. Forest and climate change working paper 9. FAO, Rome.
- FAO, 2011, State of the World’s Forests 2011.
- Food and Agriculture Organization (FAO), 2013. FAO Yearbook. Forest Economics, Policy and Products Division, Rome.
- FAOSTAT, 2013. FAO Statistics Division. <<http://faostat.fao.org/site/573/default.aspx#ancor>> (Accessed 20 June, 2013).
- Fish W.B., 1944. The Lebanon. *Geographical Review* 34 (2): 235-258.
- GIZ silvamed, 2013, Contribution of Forests to a Green Economy in the Middle East and North Africa (Evidence, drivers and policy orientations).
- Herrera P.*et al*, 2014, The Governance of Rangelands.

IDAF Climate change impacts on native tree species distribution in Lebanon: Potentiality projections t 2050.

IPCC, 2007, Fourth Assessment Report of the Intergovernmental Panel on Climate Change.

Joint report of JRC and Directorate-General Environment, 2013, Forest Fires in Europe, Middle East and North Africa, p. 68-70.

Khouzami M., Bassil M., Fortunat L., Hayek A., 1996. Étude de la diversité biologique du Liban, Liste des espèces basée sur les rapports de l'étude de la diversité biologique du Liban ; Vol. 9. MOA/PNUE, Beyrouth.

Meiggs R., 1982. Trees and timber in the Ancient Mediterranean World. Oxford University Press, Oxford.

Merlo M, Croitoru L (Eds.) (2005a). Valuing Mediterranean forests: Towards total economic value. CABI Publishing, Wallingford, Oxon.

Médail F., Quézel P., 1999. Biodiversity hotspots in the Mediterranean basin: Setting global conservation priorities. *Conservation Biology* 13 (6): 1510–1513.

Metz B., 2007. Climate Change 2007 - Mitigation of Climate Change: Working Group III Contribution to the Fourth Assessment Report of the IPCC. Cambridge University Press, UK.

Ministry of Agriculture, Regulatory decisions for administering forests and other wooded land laws.

Ministry of Agriculture, 2003, National Action Programme to Combat Desertification.

Ministry of Agriculture, 2010, Agricultural Sector Development Strategy; A plan of action (2010-2014).

Ministry of Agriculture/FAO, 2005, National Forest and Tree Assessment and Inventory, Final Report.

Ministry of Education and Higher Education – General directorate of Education/ the Nature Conservation Center in the American University of Beirut, 2014, The school guide of extra-curricular environmental activities .

Ministry of Education and Higher Education/AFDC, 2012, National Strategy of Environmental Education in Lebanon.

Ministry of Energy and Water, 1999, The Ten Year Plan of the General Directorate for Water Resources and Electricity.

Ministry of Environment, 1998, National Biodiversity Strategy and Plan of Work.

Ministry of Environment, 2001, The First Afforestation Plan.

Ministry of Environment/UNDP/ELARD, 2011, Climate risks, vulnerability and adaptation assessment.

Ministry of Environment/UNDP, 2011, Lebanon's second national communication to the UNFCCC.

Ministry of Environment/UNDP, 2012, LEBANON-Technology Needs Assessment Report for Climate Change

Ministry of Environment /AFDC, 2009, National Strategy for Forest Fire Management in Lebanon.

Ministry of Environment/LEDO, 2001, Lebanon State of the Environment Report.

Ministry of Environment/UNDP, 2010, State and Trends of the Lebanese Environment.

Ministry of Environment/ UNDP, 2009-2013, Safeguarding and Restoring Lebanon's Woodland Resources.

MOE (Ministry of Environment), 2012. *Lebanon action plan for implementing the programme of work on protected areas of the Convention on Biological Diversity*. MOE, Beirut.

<<http://www.cbd.int/protected/implementation/actionplans/country/?country=lb>> (Accessed 16 November, 2012)

Ministry of Environment/UNDP, 2013, National Greenhouse Gas Inventory Report and Mitigation Analysis for the Land Use, Land Use Change and Forestry Sector.

Ministry of Interior and Municipalities, 1977, Municipal Act, Decree-law no. 118.

Ministry of Tourism, 2015, Lebanon Rural Tourism Strategy.

Ministry of Tourism, 2010, Ministry of Tourism Strategy (2010-2014).

Ministry of Tourism/AFDC, 2012, The Environmental Education Curriculum for the 1st educational cycle grades (1, 2 & 3).

Ministry of Tourism/ECODIT/USAID, 2007, The Lebanon Mountain Trail (LMT).

Mittermeier R. A., Robles-Gil P., Hoffmann M., Pilgrim J. D., Brooks T. B., Mittermeier C. G., Lamoreux J. L., Fonseca G. A. B. 2004. *Hotspots Revisited: Earth's Biologically Richest and Most Endangered Ecoregions*. CEMEX, Mexico City, Mexico 390pp.

Nehme M. *et al.*, 2010, Pine Nuts Cluster Development Plan.

Salloum, L., and G. Mitri, 2014. Assessing the temporal pattern of fire activity and weather variability in Lebanon, *International Journal of Wildland Fire* , 23(4):503–509

Sattout E., 2014, Economic Values of Forest Ecosystems Services in Lebanon, GIZ Silva Meditteranea collaborative Partnership on Mediterranean Forests.

Quézel P., Barbero M., Bonin G., Loisel R., 1990. Recent plant invasion in the Circum-Mediterranean region, in: di Castri F., Debussche M. (Eds), *Biological invasions in Europe and the Mediterranean Basin*. Kluwer Academic Publishers, Dordrecht, pp. 51-60.

UNDP, 2011, Mainstreaming Biodiversity Management into Medicinal and Aromatic Plants Production Processes in Lebanon (Different reports).

UNDP/MoE 2009-2013. Safeguarding and Restoring Lebanon's Woodland Resources. Beirut, Lebanon.

# **Annexes**

### Annex 1. The laws and regulatory measures governing directly or indirectly forest

Laws/Decisions	Main Objective
Forest code (1949)	Forest and range management
Law dated 9/11/1951	Reforestation
Decree No. 118 (1977)	Protection of forests
Decision No. 38/1 (7/04/1982)	Protection of forest resources , Export of all forest trees products and coal of Lebanese origin prohibited
Law No. 85 (07/09/1991)	Control on forest activities,protection of all coniferous forests through banning of harvest and cut of resinous trees
Decision No.108/1 (12/09/1995)	Protection of Lebanese cedar and its gene diversity
Decision No. 92/1 (28/02/1996)	Protection of forest resources
Decision No. 92/1 (28/02/1996)	Sustainable use of NWFPs
Law 558 (1996)	Forest governance and protection, Duties and responsibilities of Forestry Department, Forest protection service established under RDNRD <sup>17</sup> Guidelines for the declaration of protected forests <sup>18</sup> put in place
Decree No. 8803 (4/10/2002)	Mining Exploitation of a quarry
Law No. 444 (8/08/2002)	Sets a framework for environmental protection and management
Decision No. 179/1 (3/03/2012)	Collaborative management of forest ecosystems
Decisions No. 705/1 (11/8/2012);No.731/1 (22/8/2012); No. 322/1 (15/4/2014)	Define guidelines on forest resources use and management

A specialized Land Tax Law of 20/12/1951 defines and determines all the land taxes payable, including on forests. The law defines the types of lands with the respective tax percentages payable. It includes both exonerated and non-exonerated categories. The tax is payable by the land proprietor but is not used for any specific land management activity.

<sup>17</sup> Not yet implemented

<sup>18</sup> Demarcation, management, financial support, supervision, activities, violations and citations: specifically maintenance of forest cover, improving forest productivity ensuring continuous yield, management of protected areas, afforestation and reforestation, regulating hunting and grazing; and geographic

Annex 2. Objectives and targets of the policy instruments related directly or indirectly to forest sector.

	<b>Policies and Strategies</b>	<b>Main objective (s)</b>	<b>Targets</b>
<b>National level</b>			
1	National Afforestation and Reforestation Program (NARP) 2014-2028	Implementing the 40 million trees Programme.	Strengthen the inter-sectoral collaboration towards consensual land use planning system
2	National Strategy for Agriculture Sector 2015 -2019	Improve the good governance and sustainable use of Natural Resources	-Strengthen of good management and sustainable use -Sustainable investment and management of rangelands -Management of NWFPs -Investment in the fisheries and aquaculture. Improve sustainable management of the sector -Irrigation systems and use of alternative sources of water and energy in agriculture
3	MoA Action Program 2010-2014 <sup>19</sup>	Adopt integrated management programmes on forest ecosystems	Sustainable management of forests and forest resources.
4	National Strategy for Forest Fire Management in Lebanon 2009	Reduce the intensity and frequency of forest fires.	A risk-management framework % 'Rs' -Common database on forest fires -Prevention measures to reduce risk <sup>20</sup> -Readiness to fight fire -Response to fires -Recovery after fires.
5	Land Use Plan for Lebanon (LUP)	Forest ecosystem services	Cultural services forests ecosystems and protected areas. Account for protective forests on top of mountains fore their regulating services

<sup>19</sup> Strategy for the Advancement of the Agricultural Sector

<sup>20</sup> Constant maintenance of communal lands and heightened awareness by local communities



6	National Forest and Tree Assessment and Inventory (Final Report, 2005)	Assessment of forest resources	Set future plans and programmes on forest ecosystems management.
7	National Afforestation plan	Combat desertification and restore degraded land	Increase the forested area of the country by about 18,000 ha out of degraded lands. Implementation instrument with detailed technical methods for afforestation and specifications of seedlings.
<b>International level</b>			
8	Convention on Biodiversity (CBD) <sup>21</sup>	Protection of biodiversity Sustainable use of biodiversity Equitable sharing of benefits arising from biodiversity	National Biodiversity Strategy and Action Plan taking into account forest in terrestrial ecosystems
9	United Nations Convention to Combat Desertification (UNCCD)	To forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas in order to support poverty reduction and environmental sustainability <sup>22</sup>	National action plan to combat desertification (2003). Formulation of proper mitigation measures and stocktaking assessment outlined the forest situation in Lebanon.
10	United Nations Framework Convention on Climate Change (UNFCCC)	To achieve "... stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."	First and Second National Communication Reports (1999-2011). Assessment of the expected impact of climate change on forests and proposed adaptation and mitigation measures. Identification of key areas to be restored and adapted to climate change effects. Define possible treatments and actions to be implemented to improve the adaptation of the vulnerable species in these areas (IDAF/LRI).
11	CITES	Control and regulate the trade in specimens of wild fauna and flora	A mechanism is put in place at MoE
12	Ozone treaties		Country programme and national strategy for phase-out of Ozone Depleting Substances (ODS)
13	Nagoya Protocol	Fair and equitable sharing of benefits arising out of the utilization of genetic resources	Draft law under the MoE

<sup>21</sup> The CBD has a programme of work on forest biodiversity

<sup>22</sup> The UNCCD strategic objective relates with the vision of the 10-Year Strategy adopted by the UNCCD parties in 2007

### Annexe 3: Major stakeholders in the forestry sector in Lebanon

	Role	Approach
<b>Ministry of Agriculture (MoA)</b>	<ul style="list-style-type: none"> <li>• RDNRD in charge of the forest sector, having the mandate to undertake projects, to detection of forest fires, necessary procedures for prevention of forest fires, to apply laws and regulations regarding the conservation and collection of forest products, and to set the terms of exploitation of forest and rangelands.</li> </ul> <p>The MoA is present on the ground through forest centres and forest guards.</p> <ul style="list-style-type: none"> <li>• the service of export and import of agricultural products and quarantine control at MoA is in charge of controlling the exportation of natural resources (Medicinal and Aromatic Plants).</li> </ul>	Leading agency in forest development, protection, management control and the sector future strategic planning
<b>Ministry of Environment (MoE)</b>	The MoE is entitled to manage all environmental subjects including the protection of natural resources.	Leading agency in environmental issues and strategic planning
<b>Ministry of Interiors &amp; Municipalities (MoI&amp;M)</b>	responsible for firefighting  The municipalities are responsible for the application of laws regarding the conservation and collection of forest products.	Control, mainstream, build capacity, awareness, planning, control on site through the municipalities
<b>Ministry of Defense (MoD)</b>	An enormous role in combating forest fires,  reforestation activities	Technical support, control on site, monitoring
<b>Ministry of Economy and Trade (MoET)</b>	The MoET is in charge for controlling the Lebanese market and quality control of the products in the Lebanese market	control and monitoring of market products
<b>Ministry of Finance (MoF)</b>	Control of exportation, Financial and Tax issues, Forest Land Ownership	Leading agency on financial issues, financial support, and managerial assistance.

<b>Ministry of Tourism (MoT)</b>	Improvement and Development of Tourism, Protected areas and Natural Reserves	mainstream, build capacity, awareness, planning,
<b>Ministry of Energy and Water (MoE&amp;W)</b>	Water issues and watershed management	Leading agency in charge of the watershed issue
<b>Ministry of Justice (MoJ)</b>	Application of suitable and relevant sentences, Forcing the Application of laws	Control, coordination, implementation of laws
<b>Ministry of Social Affair (MoSA)</b>	Active development of communities un the villages	mainstream, build capacity, awareness, planning, control on site,
<b>Ministry of Transport and public works (MoT&amp;PW)</b>	General directorate of Urban Planning is responsible of land planning	instream, build capacity, awareness, planning, control on site
<b>Ministry of Education (MoE)</b>	Include environmental education in schools and universities curricula	mainstream, build capacity, awareness, planning
<b>Ministry of Information (MoI)</b>	Manage and generate information at all levels	Promote events, raise awareness,
<b>Lebanese Standard Norms (LIBNOR)</b>	Setting and controlling the Lebanese market and quality control of the products in the market.	support (financial, technical, managerial assistance)
<b>NGOs</b>	A very important role at the different levels of awareness-raising, capacity building, management and sometimes contributing in strategy making.	support (financial, technical, managerial assistance)
<b>Research centres (CNRS, LARI)</b>	The research centers work on several issues related to monitoring and combating desertification, mapping of all water springs, erosion processes, forest fires and all the coastal area showing all water run-offs into the sea, as well as other related activities.	support (financial, technical, managerial assistance)
<b>Universities</b>	monitoring, managing and assessment of the natural resources, the erosion mechanisms and the socio-economic aspects in relation with land use and land degradation.	build capacity, awareness, planning
<b>Forest owners, Local</b>	Investors and traders of handicrafts, medicinal and aromatic plants users, Management of the Non Wood Forest Products	Control on site

<b>community, Producers</b>	(NWFP) at the forest level. Protection of forest. Sustainable exploitation of forests.	
<b>Donors and international organisations</b>		support (financial, technical, managerial assistance)

