SIXTH NATIONAL REPORT OF LEBANON

TO THE CONVENTION ON BIOLOGICAL DIVERSITY

LEBANON

6TH NATIONAL REPORT

JANUARY 2019

REPUBLIC OF LEBANON
MINISTRY OF ENVIRONMENT

gef

UNDP
Empowered lives.
Resilient nations.

The Ministry of Environment was established in 1993, and in order to address environmental challenges in Lebanon, the Ministry of the Environment identified the principles and objectives of environmental policy and strategic objectives; and thus re-organized the Ministry accordingly. The Ministry of Environment is strongly convinced about the importance of strengthening the capacity of its staff and building lasting partnerships with public and private sectors. The ministry has been able to integrate environmental concepts at different levels, and is also working to resolve the remaining obstacles in the application of the laws.

UNDP is the UN's global development network, advocating for change and connecting countries to knowledge, experience and resources to help people build a better life. We are on the ground in nearly 170 countries, working with them on their own solutions to global and national development challenges. As they develop local capacity, they draw on the people of UNDP and our wide range of partners.

LEBANON'S 6TH NATIONAL REPORT TO THE CONVENTION ON BIOLOGICAL DIVERSITY

Project Information

Project Title:
Technical Support to Eligible Parties to Produce the Sixth National Report to the Convention on Biological Diversity (6NR – Mixed Regions).
Funding Partner:
Global Environment Facility (GEF) under the management of the United Nations Development Programme (UNDP)
GEF Secretariat1818 H Street, NW, Mail Stop P4-400
Washington, DC 20433 USA
Tel: (202) 473-0508
Fax: (202) 522-3240/3245
Web: www.thegef.org

Managing Partner:
United Nations Development Programme (UNDP)

Regional support team:
UNDP Istanbul Regional Hub
Irh Key Plaza, Abidei Hurriyet Cad. Istiklal Sok No: 11
Istanbul Sisli 34209
Turkey

Lebanon Country Office:
Energy & Environment Programme
Arab African International Bank Bldg., 4th floor
Banks street, Nejmeh, Beirut 20115211, Lebanon
Web : lb.undp.org

Executing Partner:
Ministry of Environment –Lebanon
Department of Ecosystems
Lazarieh Center, 8th floor
P.O Box: 11-2727 Beirut, Lebanon
Web: www.moe.gov.lb
Lebanon BCH: http://www.biodiv.be/liban

Sub-Contracting Partner/Consultant:
Earth Link and Advanced Resources Development
Amaret Chalhoub -Zalka Highway
Fallas Building, 3rd Floor
Tel: +961 1 888305
Fax: +961 896793
Web: www.elard-group.com

Authors:
Mr. Ricardo Khoury
Dr. Manal Nader

Mr. Shadi El Indary
Mrs. Manale Abou Dagher
Mr. Mohammad S. Al Zein
Dr. Johnny Fenianos
Dr. Carla Khater
Ms. Rana Ghoussainy
Mr. Tarek Tabaja

Contributors:
All stakeholders listed under Appendix B of this report have contributed to the preparation of Lebanon's Sixth National Report to the Convention of Biological Diversity.

Reviewers:
International: Ms. Christina Supples, Ms. Marion Marigo
National: Ms. Lara Samaha, CBD Focal Point, Head of Department of Ecosystems, Ministry of Environment

TABLE OF CONTENTS

LIST OF ACRONYMS

ABT	Aichi Biodiversity Target
ACCOBAMS	Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area
AFDC	Association for Forest Development and Conservation
APJM	Association for the Protection of Jabal Moussa
AUB	American University of Beirut
AUST	American University of Science & Technology
BAU	Beirut Arab University
BCH	Biosafety Clearing House
BQE	Biological Quality Elements
CAS	Central Administration of Statistics
CBD	Convention on Biological Diversity
CDR	Council for Development and Reconstruction
CEPF	Critical Ecosystem Partnership Fund
CITES	Convention on International Trade in Endangered Species
CNRS	Centre National de la Recherche Scientifique
CoM	Council of Ministers
COP	Conference of the Parties
CPUE	Catch Per Unit Effort
CZM	Coastal Zone Management
DGA	General Directorate of Antiquities
DGUP	Directorate General of Urban Planning
EIA	Environmental Impact Assessment
ELARD	Earth Link and Advanced Resources Development
ELCA	East Levantine Canyon Area
EMT	Eastern Mediterranean Transient-Like
EU	European Union
EUNIS	European Nature Information System
FAO	Food and Agriculture Organization
FLRM	Forest and Landscape Restoration Mechanism
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFCM	General Fisheries Commission for the Mediterranean

GIS	Geographic Information Systems
GM	Genetically Modified
GMOs	Genetically Modified Organisms
GoL	Government of Lebanon
IAS	Invasive Alien Species
IBA	Important Bird Area
ICARDA	International Center for Agricultural Research in Dry Areas
IOE	Institute of the Environment
ISF	Internal Security Forces
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUCN	International Union for Conservation of Nature
JMNR	Jabal Moussa Nature Reserve
LARI	Lebanese Agricultural Research Institute
LEF	Lebanese Environment Forum
LMOs	Living Modified Organism
LPA	Lebanese Petroleum Administration
LRI	Lebanon Reforestation Initiative
LU	Lebanese University
MCR	Marine and Coastal Resources
MEHE	Ministry of Education and Higher Education
MoA	Ministry of Agriculture
MoE	Ministry of Environment
MoEW	Ministry of Energy and Water
MoI	Ministry of Industry
MoIM	Ministry of Interior and Municipalities
MoJ	Ministry of Justice
MoT	Ministry of Tourism
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MSB	Migratory Soaring Birds
MUBS	Modern University for Business and Science
NA	National Action
NBSAP	National Biodiversity Strategy and Action Plan
NCMS	National Center for Marine Sciences

NDU	Notre Dame University
NEF	National Establishment Fund
NFP	National Forest Programme
NGO	Non-Governmental Organization
NIS	Non-Indigenous Species
NR	National Report
NT	National Target
O-LiFE	Observatoire Libano-Français de l'Environnement
PA	Protected Area
PGRFA	Plant Genetic Resources for Food and Agriculture
PINR	Palm Island Nature Reserve
ROWA	Regional Office for West Asia
SALMA	Smart Adaptation of Forest Landscapes in Mountain Areas
SAP BIO	Strategic Action Programme for the Conservation of Biological Diversity in the Mediterranean Region
SC	Steering Committee
SDG	Sustainable Development Goal
SEA	Strategic Environmental Assessment
SLMQ	Sustainable Land Management in the Qaraoun Catchment
SPA/RAC	Specially Protected Areas Regional Activity Centre
SPB	Strategic Plan for Biodiversity
SPNL	Society for Protection of Nature in Lebanon
TCNR	Tyre Coast Nature Reserve
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UoB	University of Balamand
USAID	United States Agency for International Development
USEK	Université Saint-Esprit Kaslik
USJ	Université Saint Joseph

CHAPTER I. INTRODUCTION

1. LEBANON'S NBSAP OVERVIEW

Lebanon signed the Convention on Biological Diversity (CBD) during the United Nations Conference on Environment and Development (UNCED), the "Earth Summit", in Rio de Janeiro on June 5, 1992. The CBD was later on ratified by the Government in August of 1994 through Law No. 360.

According to article 6a of the CBD, each Party is required to develop a National Biodiversity Strategy and Action Plan (NBSAP) to set national measures for the conservation and sustainable use of the biological diversity, and to implement it and periodically revise it. Lebanon has submitted its first NBSAP to the CBD in 1998.

The new Strategic Plan for Biodiversity (SPB) and the Aichi Biodiversity Targets (ABTs) for the period 2011-2020 agreed on at the tenth meeting of the Conference of the Parties (COP-10) requires countries to revise their existing NBSAPs and to reinvigorate their implementation. Lebanon has updated its NBSAP in 2016 with the selection of **thirteen (13) Priority areas** (Figure 1).

Figure 1 The 13 Priority Areas as Defined by Lebanon's NBSAP (2016)

The Plan also defined **18 National Targets (NTs)** and **91 National Actions (NAs)** that were developed to support the implementation of the NTs. The NTs integrate the ABT to which the NBSAP update was based on. The Lebanese Council of Ministers (CoM) endorsed the NBSAP through Decision 62 dated April 4, 2018, upon the proposal from the Ministry of Environment.

The main mechanism by which the COP can review the implementation of the CBD and the steps taken for national implementation of NBSAPs is the National Report (NR) required under Article 26 of the Convention. These reports present measures taken for the implementation of the provisions of the Convention and their effectiveness in meeting its objectives.

Lebanon has been submitting its National Report periodically. The latest was the 5NR which was submitted in 2015. In 2017-2018, countries were requested by the CBD to update their National Reports. This report represents Lebanon's 6th NR to the CBD.

2. REPORT STRUCTURE

This report is structured in five Chapters:

Chapter I: Introductory Chapter with an overview on Lebanon's NBSAP.

Chapter II: Work Methodology adopted for the preparation of the 6NR.

Chapter III: 6NR Report in line with the guidelines offered by the CBD for the preparation of the 6th NR under CBD/COP/DEC/XIII/27.

Chapter IV: Conclusion and Recommendations including the main obstacles and challenges observed in Lebanon's implementation of NBSAP and main recommendations for improvement.

Chapter V: Appendices

CHAPTER II. WORK METHODOLOGY

SUMMARY OF ACTIVITIES AND PROJECT PHASES

The 6th National Report to the Convention on Biological Diversity (CBD) was prepared by the Lebanese Ministry of Environment (MoE) with financing by GEF under the management of the United Nations Development Programme (UNDP) and the technical support from Earth Link and Advanced Resources Development (ELARD) s.a.l. In preparing the report, the following methodology and main steps were adopted:

- Phase I – Literature Review of Local and International Publications since 5NR that was submitted to the CBD in 2015.

A comprehensive desk review was undertaken focusing on studies conducted and publications issued since the 5th NR.

- Phase II – Stakeholders Identification, Engagement and Consultation

Throughout the 6NR preparation, data was collected from stakeholders during interviews and bilateral meetings.

A Steering Committee (SC) was formed to inform the process and make major decisions. The composition of the SC is provided in Appendix C.

Two meetings with the SC were carried out at the MoE.

Furthermore, two Consultation Meetings with wider stakeholders were carried out. The list of stakeholders that were engaged in the interviews, bilateral meetings and Consultation Meetings is provided in Appendix B.

The first Multi-Stakeholder **Thematic Consultation Meeting** (Figure 2) took place on August 29, 2018. The main objectives of the meeting were to:

- Identify information about the measures which have been taken in Lebanon to implement each NT of the NBSAP;
- Identify information gaps necessary to undertake the assessment of implementation measures and assessment of progress towards national targets; and
- Validate methods to address information gaps.

Figure 2 Photographic Documentation of the First Thematic Consultation Meeting

Stakeholders were grouped into 2 main Themes: Marine and Terrestrial. The Terrestrial theme was further broken down into 6 groups:

- Protected areas
- Land use planning and impact
- Agrobiodiversity conservation and biosafety
- Threats and actions in relation to biodiversity conservation
- Legal framework and financing
- Advocacy and awareness

Based on the outcome of the First Consultation Meeting, a compilation of the final list of measures taken in Lebanon to implement each NT was done, this was used to develop the Zero Draft for each NT. This was necessary to analyze the effectiveness, obstacles and barriers, and capacity needs of each measure for a specific NA. Additionally, progress towards NTs based on indicators was assessed along with an evaluation of the level of confidence of the assessment and adequacy of monitoring information that supports the assessment of progress.

Validation of the assessment of effectiveness of measures and progress towards the NTs was conducted during the Second Thematic Consultation Meeting which was carried out on November 6, 2018 (Figure 3). Stakeholders were grouped into 5 Groups as presented in Table 1.

Table 1 Second Thematic Consultation Meeting Grouping

Group #	Theme	National Targets				
Group 1	Status of fauna and flora and conservation actions	1	2	18		
Group 2	Protected Areas and nature reserves	4	5	7	18	
Group 3	Threats and Actions related to Biodiversity Conservation	6	9	11	14	18
Group 4	Education, research and knowledge	12	15	16	18	
Group 5	Mainstreaming biodiversity	8	13	17	18	

Around 40 stakeholders and 55 stakeholders (excluding 6NR team) from various background from government institutions, academic and research institutions, NGOs, etc. participated in the first and second workshop respectively; it is worth to note that around 70% of the attendees are women.

- Phase III: Analysis and reporting of the 6th National Report was drafted based on inputs from phase 1 and phase 2.

Figure 3 Photographic Documentation of the Second Thematic Consultation Meeting

CHAPTER III. 6NR REPORT

Chapter III is divided into 2 Parts to reflect the sections specified in the guidelines offered by the CBD for the preparation of the 6th NR under CBD/COP/DEC/XIII/27.

- **Part 1: National Targets Reports**

  Each NT report includes the following sections:

  Section I: Information on targets being pursued at the National Level

  Section II: Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve the National Targets

  Section III: Assessment of progress towards each NT

- **Part 2: Lebanon's contribution to Global Targets and Goals and Updated Country Profile**

  Part 2 includes the following sections:

  Section IV: Description of the National contribution to the achievement of each global ABT

  Section V: Updated biodiversity country profile

PART 1: NATIONAL TARGETS REPORTS

NATIONAL TARGET 1

Section I - Information on the targets being pursued at the national level

National Target

National Target 1: By 2030, the status of 75% of known flora and fauna species is identified and conservation actions are implemented on 50% of threatened species.

Rationale

Threatened species are seen as important but not yet a priority area in Lebanon; a national red list of plant species to be published in January 2019 will include around 108 threatened species.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☒ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 1: Threatened Species.

Relevant websites, web links and files

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

National Target 1: By 2030, the status of 75% of known flora and fauna species is identified and conservation actions are implemented on 50% of threatened species.

National Actions

National Actions for National Target 1:

National Action 1.1 Update the 1996 biodiversity national inventory (Biodiversity Country Study) prepared by the MoA based on field surveys of fauna and flora

National Action 1.2 Develop criteria for the evaluation of conservation status for identified flora and fauna and evaluate the status of the species in the updated inventory

National Action 1.3 Initiate a program for mapping and monitoring threatened species in key/ selected ecosystems

National Action 1.4 Include threatened species in national conservation strategies and regulations; namely in-situ and ex-situ conservation programs

National Action 1.5 Develop species-specific conservation legislation and conservation action plans to ensure conservation of important species, particularly endemic/ threatened species

Measures Taken to contribute to the implementation of NA1.1

NA 1.1: Update the 1996 biodiversity national inventory (Biodiversity Country Study) prepared by the MoA based on field surveys of fauna and flora

There are **two** main measures that contribute to the implementation of the NA1.1. One measure focuses on terrestrial biodiversity while the other focuses on marine and freshwater biodiversity.

Measure 1.1a: Compiling information (field surveys and national reports) to update the terrestrial biodiversity national inventory

This includes some work that was done at the governmental institutional level:

- Ongoing field surveys are being conducted by the Lebanese Agricultural Research Institute (LARI) contribute to the achievement of this national action. These surveys focus on fruit trees, cereals, crop wild relatives, as well as edible, economically important and endangered species.
- The National Committee for Plant Genetic Resources for Food and Agriculture (PGRFA) at the Ministry of Agriculture (MoA), involving representatives from the Lebanese Agricultural Research Institute (LARI), prepared the Lebanon country report on biodiversity for food and agriculture, which was submitted to FAO in July 2016.
- A report on the distribution and characterization of *Pyrus syriaca* in Mount Lebanon and Bekaa was prepared also by the Lebanese Agricultural Research Institute (LARI) and published in 2018.
- Field guides to birds were produced by MoE and partners in the context of the new hunting law in Lebanon.
- Checklists of plant species and some animals of nature reserves have been/ are being developed:
    - Ehden: Flora and Fauna Assessment (Bou Dagher – USJ);
    - Jabal Moussa Biosphere Reserve: Tohme and Tohme on flora; A Rocha and Jaradi on birds; Abi Said on mammals; Sadek and Hraoui on reptiles;
    - Shouf Biosphere Reserve: Tohme and Tohme on flora; Jaradi on birds; Abi Said on mammals;
    - Tannourine Cedars Nature Reserve: Arnold and Beyrouthy on flora; Nemer on insects; Abi Said on mammals; EcoMed on herpetofauna; Modad on fungi;

- Chnaniir: Beyrouthy on flora;
- Wadi El Hujeir: First assessment of flora in collaboration with LU.

Several universities, including the Lebanese University (LU), Beirut Arab University (BAU), American University of Beirut (AUB) and Saint Joseph University (USJ), have conducted national surveys on endemic and non-endemic flora and fauna. Contributions include:

- An updated checklist of the endemic plants of Lebanon being carried out by Dr. Bou Dagher Kharrat (USJ).
- Flora of Kfar Debian area carried out by Dr. Bou Dagher Kharrat (USJ).
- An updated checklist of coastal plants is being done by Al-Zein (AUB).
- An updated list of the herpetofauna of Lebanon is being completed by Dr. Sadek (AUB) and Dr. Souad Hraoui Bloquet (LU).
- A list of the mammals of Lebanon, particularly small rodents and bats, is being compiled by Dr. Abi Said (LU).
- An updated list of the mosquitoes and fruit flies of Lebanon is being carried out by Knio (AUB). Knio is also working on a checklist of the insects of Bentael Nature Reserve and coastal insects.
- An updated list of bumblebees and solitary bees of Lebanon is being compiled by Abou Fakhr Hammad (LU) in cooperation with ICARDA.
- An updated checklist of the Cerambycidae, Dermestidae of Lebanon was published by Nemer (USEK).
- A list of semi-natural populations of carob (Ceratonia siliqua) in Lebanon was surveyed, characterized and published by Chalak (LU) and El Hajj (LARI) and others.
- A study on the economic aspects of some plant species is being carried out (Baydoun (BAU), Arnold (USEK) and Chalak).
- An assessment of the flora and fauna of Jourd Tannourine is being developed by The Institute of the Environment at the University of Balamand in collaboration with the Municipality of Tannourine. The report, prepared by Dr. Nader and Dr. Mitri, is in its final draft preparation and will be submitted to the Municipality of Tannourine by the end of May 2019.
- A consortium of universities are working on the flora of Mount Hermon with emphasis on medicinal plants. This work involves Nelly Arnold (Holy Spirit University Kaslik), Safaa Baydoun (Beirut Arab University) and Lamis Chalak (LU). A first checklist of the flora of Hermon, including its endemics was published 2015.
- Identification of oaks and other tree species (Stephan and Teeny 2017; Stephan and Issa 2017).
- Some Masters theses contribute to the achievement of this national target; e.g. two theses (Ghossain, 2014) on the flora of Baabda forest, and (Chalhoub, 2012) on medicinal plants of Baabda forest at LU; and one (Itani, 2015) at AUB.
- National Nongovernmental Organizations (NGOs) also contribute to this NA:
- Field guides to plants, butterflies and birds have been developed by the Society for the Protection of Nature in Lebanon. A field guide to the wild flowers of Lebanon, with special emphasis on the flora of Key Biodiversity Areas (KBAs) was also published by Machaka-Houri and Houri (2015).
- An updated checklist of the birds of Lebanon is being prepared by Jaradi, Itani and Hogg. The list will be published in Autumn 2019.
- The State of the Forests report, edited by Mitri (University of Balamand) and produced by AFDC in collaboration with MoA, MoE, and NGOs will be published in 2019.
- Field guides for four medicinal plants (Rosa damascena, Thymbra spicata, Salvia fruticosa, Lavandula stoechas) by Safadi Foundation and Jihan Noun (LU).

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 1 and National Priority Area 1: Threatened Species.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

The methodology followed for the assessment of effectiveness of each measure considered for the implementation of the NAs is related to the degree of implementation of the measure at the national level or endorsed by a governmental institution such as the MoE. Whereby:

- If the measure was completely implemented or actively under implementation then it was considered effective;
- If the measure was at the planning stage or early implementation then it was considered partially effective;
- It the measure's implementation did not start yet, then it was considered ineffective; and
- If there are no tangible information on the implementation of the measure, then its effectiveness is considered unknown.

In terms of activities carried out to update the national terrestrial biodiversity inventory, whilst there was a significant work undertaken by national institutions as well as national reports and private institutions (academic institutions and NGOs) that could contribute to the updating of the biodiversity national inventory; however, no national initiative has been undertaken to launch field surveys or data compilation from existing work for the purpose of updating this national inventory. In other words, the measure has not been implemented at the national scale or at the appropriate institutional level. Therefore, this measure is considered partially effective.

No major changes to government policies, or changes in the behavior of major sectors in the country were witnessed.

Relevant websites, web links and files

- www.moe.gov.lb
- www.cnrs.edu.lb
- Williams, Emma Victoria, Joëlle Breidy, Michael van Slageren, and Simon Khairallah. "New records for the flora of Lebanon." Webbia 70, no. 2 (2015): 323-327.
- http://www.pgrfa.org/WIEWS
- http://www.lebanon.plantgenetic.com/
- www.aoad.org/gb/home.aspx
- Demopoulos, H., 2008. A Study into the Importance of Jabal Moussa for Birds in Lebanon. A Rocha Lebanon.
- Demopoulos, H., 2008. Jabal Moussa Important Bird Area. A Rocha Lebanon.
- Tohmé, G & Tohmé, H, 2010. La Réserve de la Biosphère du Jabal Moussa: une mosaïque végétale. Jabal Moussa
- Abi Saad, M, 2010. Insanity or reality: mammals of Jabal Moussa Biosphere Reserve. Jabal Moussa
- Abi Saad, M, 2010. A BASELINE SURVEY OF THE MAMMALS IN JABAL MOUSSA NATURE RESERVE (JMNR). Jabal Moussa
- http://shoufcedar.org/wp/wp-content/uploads/2017/06/FINAL-BOOK5.pdf
- Tohmé, G & Tohmé, H, 2017. Liste des plantes de la réserve de biosphère du Chouf. Shouf Biosphere Reserve.
- Chehade Ali, 2017. Country report on the implementation of the International Treaty on Plant Genetic resources for Food and Agriculture (ITPGRFA). pp. 21.

- Chehade Ali, Ibrahim Fatima , Jebawi Fatima, 2018. Diversity of wild Pyrus syriaca in Bekaa and Mount Lebanon regions, Lebanon. LARI report.
- Ghossein, C. 2014. La biodiversité végétale de la foret de Baabda : étude floristique d'une foret méditérannéenne libanaise. MS Thesis. Lebanese University.
- Chalhoub, S. 2012. Un manuel de certaines plantes médicinales de la forêt de Baabda. MS Thesis. Lebanese University.
- Itani, M. (2015). Physiognomy as a basis for plant species conservation in urban areas: Beirut as a case-study. American University of Beirut, Beirut.

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

There is a shortage of taxonomists at the national level, particularly specialists working on microorganisms and non-vascular plants, fungi, and some invertebrate groups.

There is a lack of funds from the national budget to carry out a biodiversity inventory at the national level, it is recommended that a national initiative be undertaken to compile the data acquired from public and academic and research institutions on specific sites and to carry out biodiversity field surveys in the sites where it lacks, and to strengthen the coordination among relevant institutions and involved stakeholders.

Relevant websites, web links and files

-

Measure 1.1b: Compiling information (field surveys and national reports) to update the marine and freshwater biodiversity national inventory.

Contribution to the implementation of the NA1.1 for marine biodiversity was mainly from national government/ international institutions projects:

- Ecological characterization through biodiversity field surveys were carried out in 2016 by the Regional Activity Centre for Specially Protected Areas (SPA/RAC) in collaboration with the Ministry of Environment in three of the proposed coastal MPAs of Lebanon: Batroun, Medfoun and Byblos within the EU-funded MedMPA Network Project executed at regional level by SPA/RAC. The field surveys were carried out by a mixed team of national and international experts from SPA/RAC, the National Center for Marine Sciences of Lebanon-CNRSL, University of Alicante, and IUCN (www.moe.gov.lb; www.rac-spa.org).
- In 2016, the Ministry of Environment has started to implement the project, "Towards deep-sea conservation in Lebanon", in collaboration with Oceana, SPA/RAC, IUCN and the Lebanese National Centre for Marine Research, and with funds from MAVA; between 3 and 28 October 2016, experts from Oceana, SPA/RAC, IUCN and the Lebanese National Centre for Marine Research, have concluded an expedition in five deep-sea previously unstudied areas of Lebanon: Jounieh canyon, Saint Georges canyon, Beirut(Ouzai) canyon; Sayniq (Saida)canyon, and Chekka – Batroun canyon.
- The Ministry of Environment (MOE) in Lebanon updated the 2002 SAP-BIO National Report in 2016, under the "Policy and Legislative Development for Mainstreaming the Sustainable Management of Marine and Coastal Ecosystems in Lebanon" Project, executed by MoE, funded by the Global Environment Facility (GEF) and implemented by the United Nations Environment Programme (UNEP). The SAP-BIO national report was prepared as a requirement

from the Regional Activity Centre for Specially Protected Areas (SPA/RAC)in order to establish a logical base for implementing the new Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean Sea through producing a Strategic Action Plan (SAP) for the conservation of marine and coastal biodiversity in the Mediterranean. To achieve this goal, each Mediterranean country prepared a National Report on coastal and marine biodiversity in a standardized format.

- Project CANA + implemented by CNRS between 2015 and 2018 on Freshwater ecosystems in Kasmieh, Damour, and Nahr Ibrahim has three main tasks:
  - Monitoring wastewater outflows and environmental remediation studies at newly established and functioning wastewater treatment plants (Batroun, Tabarja, Ghadir, and Sidon);
  - Studying marine freshwater springs: sources, quality, abundance, and seasonal outflows (Chekka, Maameltein, Qasmieh, and Tyre); and
  - Surveying the alteration of coastal eco-systems caused by estuaries and sediment outflows (contaminants) into the sea and their effects on freshwater/seawater interface and geological changes in the nature of the seafloor - erosion and degradation. (Nahr Ibrahim, Nahr el-Damour, and Nahr el-Qasmieh).

  Inventory done by the CANA+ covered:
  - Fish stocks
  - Invasive fish species
  - Dolphin watching
  - Seawater properties
  - Marine sediments
  - Seawater circulation
  - Operation freshwater
  - Bathymetry: Tyre unknown; Jounieh neighborhoods; Beirut approaches; Damour to Halat
- National Agreement to protect Litani Basin and protocol signed between Litani River Authority and CNRS. Both parties agreed to study the status of Lake Qaraoun and determine the best methods to deal with the existing pollution, to ensure the success of cooperation between the two parties of the agreement in the development of a joint program to study the environment of the lake and the best management practices for water basins (http://www.cnrs.edu.lb/english/newsroom/news/توقيع-مذكرة-تفاهم-بين-المجلس-الوطني-للبحوث-العلمية-والمصلحة-الوطنية-لنهر-الليطاني).
- Distribution of Marine Birds along the Lebanese Coast (Dr. Jaradi): The study of marine birds in the northern part of Lebanon published in 2017, recorded 2681 individuals, distributed over 86 species. Among them 35 are foreshore species, 18 coastal, 6 maritime, 9 ducks, 6 herons, 9 various saltwater related species and 3 terrestrial. The highest density is shown by the yellow-legged Gull Larus michahellis and common black-headed gull Chroicocephalus ridibundus.
- PhD study with Ali Fadel on freshwater ecosystems published in 2014. The main objective of this Ph.D. work was to understand the dynamics of phytoplankton in Qaraoun Reservoir. This main objective branched into three sub-objectives: 1) to establish the seasonal phytoplankton succession 2) to understand the cyanobacterial dynamics, and 3) identify the driving factors of the cyanobacterial blooms. Qaraoun Reservoir which usually strongly stratifies between May and August was found eutrophic with a low biodiversity. Thermal stratification established in spring reduced the growth of diatoms and resulted in their replacement by mobile green algae species.

- Assessments on existing freshwater biodiversity was held targeting mainly the Litani River covering its different aspects of physical, chemical and biological characteristics.
- Some Doctoral thesis done at the National Center for Marine Studies (NCMS) of the National Council for Scientific studies (CNRS) contribute to this NA. These include:
    - A PhD study on Chondrichthyian along the Lebanese coast narrowed down the list from 44 to 25 species. It is believed that at present, this is the most comprehensive and realistic list of Chondrichthyes (www.cnrs.edu.lb).
    - A PhD study on phytoplankton's targeting dinoflagellates with a focus on Ostreopsis sp and the development of related harmful algal blooms (www.cnrs.edu.lb).
    - A PhD study on Zooplankton species and their temporal variability in the Levantine Sea and its relation to the Eastern Mediterranean Transient-Like (EMT) event (www.cnrs.edu.lb).
    - A PhD study on Lebanese Coastal ecosystems: evolution, ecology and conservation/Formation, in addition to a paper by Ali Badreddine.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 1 and National Priority Area 1: Threatened Species.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

In terms of activities carried out to update the national marine biodiversity inventory, there was significant work undertaken at the national level. Field surveys of marine biodiversity in Lebanese waters and ecological characterization was done in nine coastal sites and five deep sea sites from South Lebanon till North from 2012 till 2106. There is still a need to implement a long-term monitoring system, however this measure is considered effective.

Relevant websites, web links and files

- www.moe.gov.lb
- www.rac-spa.org
- www.faoeastmed.org
- www.cnrs.edu.lb
- https://oceana.org/
- www.iucn.org
- MoE, SPA/RAC and partners (2018). Ecological Characterization of potential MPAs in Lebanon: Batroun, Medfoun and Byblos.
- MoE, Oceana and partners (2018). Deep Sea Lebanon: Results of the 2016 expedition, exploring submarine canyons).
- MoE/GEF (2016). Updating the 2002 SAP-BIO National Report for the Country of Lebanon. Prepared by Nader M., and Talhouk S. May 2016.
- Lteif M. (2015). Biology, distribution and diversity of cartilaginous Fish species along the Lebanese Coast, Eastern Mediterranean. Ecology, environment. Université de Perpignan, 2015. English.<NNT : 2015PERP0026>. <tel-01242769>.
- Açaf, L. (2018). Ecology of benthic and planktonic dinoflagellates of Eastern Mediterranean Sea: a focus on Ostreopsis and Ceratium genus along the Lebanese coast. Sorbonne Université Ecole Doctorale des Sciences de l'Environnement d'Ile de France, ED 129

- Laboratoire d'Océanographie de Villefranche-sur-mer (LOV)
- Ouba A, Abboud-Abi Saab M, Stemmann L (2016) Temporal Variability of Zooplankton (2000-2013) in the Levantine Sea: Significant Changes Associated to the 2005-2010 EMT-like Event? PLoS ONE 11(7): e0158484. doi:10.1371/journal.pone.0158484
- El Zein, G., & Khalf, G., 2012. La Composition et la Distribution du Peuplement des Poissons Marins Migrateurs dans Quelques Rivieres Libanaises et L'Impact des Amenagements sur la Migration de ces Poissons. Lebanese University and CNRS.
- Alwan N, Esmaeili H-R, Krupp F (2016) Molecular Phylogeny and Zoogeography of the Capoeta damascina Species Complex (Pisces: Teleostei: Cyprinidae). PLoS ONE 11(6): e0156434. doi:10.1371/journal.pone.0156434.
- El Zein, G., 2010. Premières données sur l'inventaire et la distribution de l'ichtyofaune du bassin du Litani au Liban. Lebanese University.
- Dia, A., 2010. Répartition et écologie des Hydropsyches du Liban, et liste des Trichoptères du Liban. Lebanese University and CNRS.
  Peter Glöer , Aref Dia & Gerhard Falkner (2012) The genus Pseudobithynia in Lebanon, with a redescription of three species and additional notes on its ecology, Zoology in the Middle East, 57:1, 87-96, DOI: 10.1080/09397140.2012.10648967
- Ramadan-Jaradi G. 2017. Status And Distribution Of Migrating And Breeding Marine Birds In North Lebanon. Lebanese Science Journal, Vol. 18, No. 2, 156.

Other Relevant Information

- Badreddine A. (2018): Lebanese coastal ecosystems: evolution, formation and conservation
- Universtie de Nice Sphia Antipolis Ecommerce
- CNRS Marine Center

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

There is a shortage of taxonomists, oceanographers and general marine scientists at the national level.

In addition, marine research is extremely expensive and requires constant financial and material support. More specifically, equipment is very costly and requires constant maintenance. In addition, marine research suffers from its full dependence on climatic condition that tremendously delay work and increase financial burdens. Main challenges are also encountered in the knowledge base and the culture of coastal and marine research in the country.

Even though some advancements have been made in terms of marine related studies (biodiversity, fisheries, pollution, MPAs,…), these main challenges still express themselves in the absence of proper, long-term, monitoring programs, especially for physical oceanography parameters amongst many others.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 1.2

NA 1.2: Develop criteria for the evaluation of conservation status for identified flora and fauna and evaluate the status of the species in the updated inventory

There are **two** measures that contribute to the implementation of the NA1.2.

Measure 1.2a: Preparation of national conservation status on some group of terrestrial species

- The conservation status of butterfly species at Tannourine Cedars Nature Reserve has been evaluated;
- The Lebanese Agricultural Research Institute (LARI), in collaboration with MoA, characterized local varieties of olives (*Olea europaea*) in Lebanon. The former also undertook studies of figs, mulberries and stone fruits;
- A draft of the national red list of birds is in preparation by Jaradi, Itani and Hogg; it is expected in spring 2019;
- A report on the distribution and characterization of *Pyrus syriaca* in Mount Lebanon and Bekaa was developed by the Lebanese Agricultural Research Institute (LARI).

On the other hand, contributions from private initiatives and academic institutions include:

- Initiative to conserve indigenous honey bees undertaken at BAU - Research Center for Environment and Development.
- Initiative on the conservation of *Iris* spp. and assessment of their genetic resources was undertaken by Dr. Bou Dagher Kharrat (USJ).
- The LU has undertaken and published in collaboration with LARI and other stakeholders an assessment of local/traditional germplasm of olive, pears, loquat, carob and pomegranate.
- A national initiative to issue a red list of the flora of Lebanon with emphasis on endemic species, was led by Dr. Bou Dagher Kharrat (USJ).
- Dr. Sadek from the American University of Beirut was involved in the global assessment of amphibians and reptiles which took place in Malaga, Spain in 2004. However, an assessment at the national level would be needed to red list amphibians and reptiles, but such assessment requires extensive field surveys to update distribution maps and assess the impact of climate change on all species of reptiles and amphibians at the national level.
- There is an ongoing project to red list tree species in Lebanon (Stephan -Lebanese University).
- Evaluation of the conservation status of insect pollinators in northern Lebanon (Nemer - USEK). This is a continuous project that is being conducted since 2018 until 2021. The red list is expected to be issued soon.
- In the context of projects funded by CEPF, an assessment of the conservation status of endemic plants, including three endemic species at the Jabal Moussa Biosphere Reserve, three endemic species in Knaiseh and four endemic species in Makmel will be done (Drs. Bou Dagher Kharrat (USJ) and Semaan (Friends of Nature in Lebanon). This assessment started in November 2018 and is still ongoing.

Contributions by NGOs:

- A global initiative was undertaken in 2016 to red list monocots of the Mediterranean. Therefore, only monocots that are endemic to Lebanon have been assessed at the national level as well. Part of the assessment was published and some species' assessment is currently under review and will be published soon. (Semaan - Friends of Nature).

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 1 and National Priority Area 1: Threatened Species.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure contributes to the evaluation of the status of some species. Scattered activities have so far been undertaken, mostly by academic institutions and research institutions.

There was some work undertaken to evaluate the conservation status for some groups of fauna and flora using international criteria developed by IUCN. The criteria for the evaluation of the conservation status for the identified fauna and flora have not been developed at the national level.

As such, this measure is considered partially effective since it is at the early stages of implementation.

Relevant websites, web links and files

- Chehade Ali, Ibrahim Fatima, Jebawi Fatima, 2018. Diversity of wild Pyrus syriaca in Bekaa and Mount Lebanon regions, Lebanon. LARI report.

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The national inventory has not been updated; moreover, criteria for the evaluation of the conservation status of fauna and flora have not been developed yet at the national level. International criteria such as IUCN criteria are adopted.

No official national red list exists yet in Lebanon. Some red lists, such as for birds, amphibians, reptiles and plants, exist as drafts and will be published in 2019.

A national red list needs to be developed before this NA can be achieved.

Initiatives need to be-well coordinated to cover a wider variety of species at the national scale.

Relevant websites, web links and files

-

Measure 1.2b: Preparation of national conservation status on some group of marine species

Contribution to the implementation of the NA1.2 for marine biodiversity (Fauna and Flora) cover the following activities:

Fauna

- The NCMS-CNRS studied the population structure and sexual maturity of the pufferfish Lagocephalus sceleratus in 2014 showing close results to the study held by the MCR-IOE-UOB. The NCMS-CNRS also initiated biological studies and stock assessment studies targeting Sardinella aurita, Engraulis encrasicolus, Lithognatus mormyrus and Pagellus erythrinus in collaboration with the FAO-EastMed project. Results are expected to be published in related scientific journals (www.cnrs.edu.lb).
- The NCMS-CNRS conducted a mammalian scientific mission onboard CANA vessel over two years (2011-2013) in coordination with the ACCOBAMS (Agreement on the Conservation of Cetaceans

in the Black Sea, Mediterranean Sea, and Contiguous Atlantic Area). The main output of this task is a protection plan both for mammalian and fishery resources on the basis of qualitative evaluation of marine fauna. Specific research and studies on the Cetaceans in the Lebanese waters were conducted with the aim of detecting the existence of their habitats, their areas of distribution and density, their status and development, their proliferation and migration patterns and routes, breeding areas and food requirements (www.cnrs.edu.lb).

- The NCMS-CNRS is conducting a regular monitoring on water quality along the Lebanese coastline. Physical, chemical and microbiological parameters are being monitored. In Addition regular studies on zooplanktons have been carried out since late 1970's describing different related variables (www.cnrs.edu.lb).
- Impact of Recreational fishing in Lebanon: IUCN and the MOA have done a basic site specific assessment, related to Tyre, document is still in pre-publication phase (www.IUCN.org).
- The NCMS-CNRS in collaboration with ACCOBAMS have accomplished in August 2018 a survey targeting cetaceans in the Lebanese waters. Cana vessel was used for several days adopting the recommended methodology (www.cnrs.edu.lb).
- Ecosystem Approach to Fisheries in Lebanon - Purse Seine Sardine Fisheries: the FAO-EastMed and the Marine and Coastal Resources Program at the Institute of the Environment at the University of Balamand (MCR-IOE-UOB) implemented a pilot case study on the Ecosystem Approach to Fisheries in Lebanon targeting the purse seine fishery. Purse seining fishing mainly sardines reveals higher CPUE and incomes than other fishing gears and have significant economic values. A management plan for the purse seine fishery in collaboration with, and for the benefit of the Ministry of Agriculture (MoA) was produced using the participatory approach (www.faoeastmed.org). The management plan is yet to be endorsed by the related authorities.
- A study of vermitidae reefs was published by CNRS.

Flora

- CARLIT methodology: Macroalgae is one of the Biological Quality Elements (BQE) used by several indexes conceived in the European Water Framework Directive (WFD) for the assessment of the Ecological status of coastal water bodies. CARLIT method implemented by the team of the NCMS-CNRS allowed the collection of accurate information on the distribution and abundance of shallow-water communities, especially of those deserving protection (e.g. Cystoseira forests). Thus, the study represents a baseline for future studies and gives useful tools for the management of human impacts on the Lebanese coast (www.cnrs.edu.lb).
- The NCMS-CNRS is conducting a regular monitoring on water quality along the Lebanese coastline. Physical, chemical and microbiological parameters are being monitored. In Addition regular studies on phytoplanktons have been carried out since late 1970's describing different related variables (www.cnrs.edu.lb).

At the academic levels, contributions include:

- A scientific book, written by Hussein Kanaan, was published in 2016 entitled "Marine Algae of the Lebanese Coast" identifying and listing different macroalgae along selected sites representing the Lebanese coastal zone.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 1 and National Priority Area 1: Threatened Species.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure contributes to the evaluation of the status of some species.

The criteria for the evaluation of the conservation status for the identified fauna and flora have not been developed at the national level.

As such, this measure is considered partially effective since it is at the early stages of implementation.

Relevant websites, web links and files

- www.faoeastmed.org
- Khalaf G, Saad A., Jemaa S., Sabour W., M. and Lelli S. (2014). Population Structure and Sexual Maturity of the
- Pufferfish Lagocephalus sceleratus (Osteichthyes: Tetraodontidae) in the Lebanese and Syrian Waters (Eastern Mediterranean). Journal of Earth Science and Engineering, 4: 236-244.
- www.cnrs.edu.lb
- www.IUCN.org
- Badreddine, A., Abboud-Abi Saab, M., Gianni, F., Ballesteros, E., Mangialajo L. First assessment of the Ecological Status in the Levant Basin: application of the CARLIT index along the Lebanese coastline. Ecological Indicators - 85 (2018): 37-47.
- Marine Algae of the Lebanese Coast UK ed. Editionby Hussein Kanaan (Author, Editor), Oksana Belous (Editor)

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Initiatives need to be well coordinated to cover a wider variety of species on a national scale.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 1.3

NA 1.3: Initiate a program for mapping and monitoring threatened species in key/ selected ecosystems

There is **one** main measure that contributes to the implementation of the NA1.3.

Measure 1.3a: Mapping and monitoring some threatened species

- The NCMS-CNRS in collaboration with ACCOBAMS have accomplished in August 2018 a survey targeting cetaceans in the Lebanese waters. Cana vessel was used for several days adopting the recommended methodology (www.cnrs.edu.lb).
- Within the "Integrated Monitoring and Assessment programme (IMAP)" executed at regional level by the Regional Activity Centre for Specially Protected Areas RAC/SPA, a national monitoring programme for marine biodiversity in Lebanon was prepared in 2017 by RAC/SPA in close coordination with the Ministry of Environment and it included a national monitoring programme to each of the following: Non-indigenous species (NIS), marine turtles, coastal and marine birds, fisheries, cetaceans and habitats. In addition, a national action plan on marine species introductions and invasive species in Lebanon was prepared in 2018 by RAC/SPA in close coordination with the Ministry of Environment (www.moe.gov.lb; www.rac-spa.org).
- Programme to monitor freshwater phytoplanktons in Qaraoun Lake.

At the academic level, the following activities were carried out:

- Some threatened plant species (coastal and alpine) were mapped and monitored for one year in the context of a regional project (Conserving wild plants and habitats for people across the Mediterranean) implemented by the Nature Conservation Center, American University of Beirut (Al-Zein, personal communication).
- Plant species were mapped in the context of identifying Important Plant Areas in Lebanon (Bou Dagher Kharrat et al. 2018).
- Some work was done on the distribution of some *Prunus* spp. and their conservation status by Chalak et al. (Lebanese University) in collaboration with LARI, Baydoun (Beirut Arab University) and Sayah (Lebanese University).

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 1 and National Priority Area 1: Threatened Species.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Monitoring activities on national scale are still in the early phase of planning and implementation; this measure is partially effective.

Relevant websites, web links and files

- www.cnrs.edu.lb
- www.moe.gov.lb
- www.rac-spa.org
- http://www.pgrfa.org/WIEWS
- Bou Dagher-Kharrat M, El Zein H, Rouhan G. Setting conservation priorities for Lebanese flora—Identification of important plant areas. Journal for Nature Conservation. 2018 Jun 1;43:85-94.
- Chehade Ali, El Bittar Ahmad, Chalak Lamis, 2015. Wild Prunus as Potential Species for Restoration in Bekaa Region. Poster, in International conference on Ecological Restoration in the Mediterranean Region: Challenges and Opportunities, Saint Joseph University, Beirut, Lebanon, 14-16 October 2015.
- L. Chalak, A. El Bittar and A. Chehade, 2014. Diversity of Wild Prunus in the Bekaa Province, Lebanon. Proc. Ist IS on Fruit Culture and Its Traditional Knowledge along silk road countries, Acta Hort. 1032, ISHS 2014: 207-213

Other Relevant Information

- A monitoring plan for Caracal at the Shouf Biosphere Reserve is being developed by Abi Said.
- Species richness and threatened species richness maps were developed using UN Biodiversity Lab mapping tool.

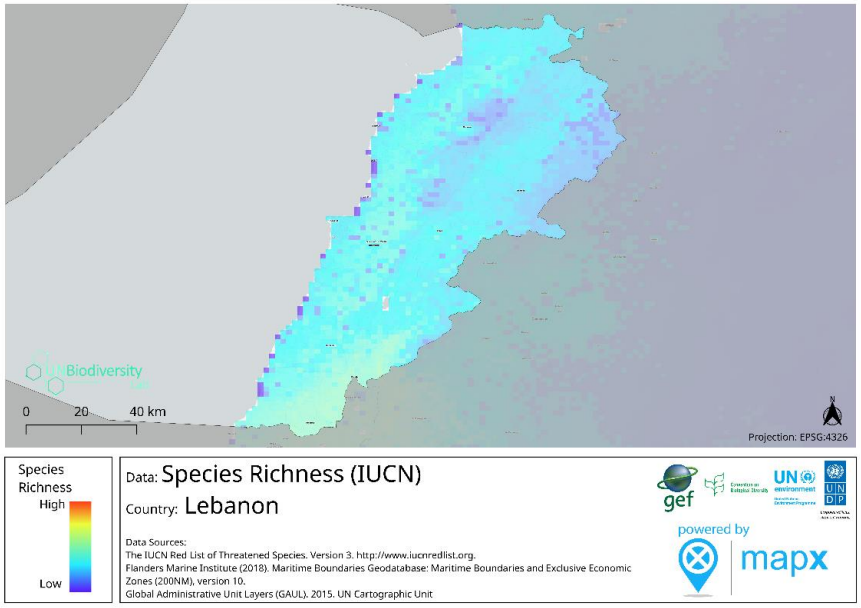


Figure 4 Species Richness

Source: UN Biodiversity Lab, 2018

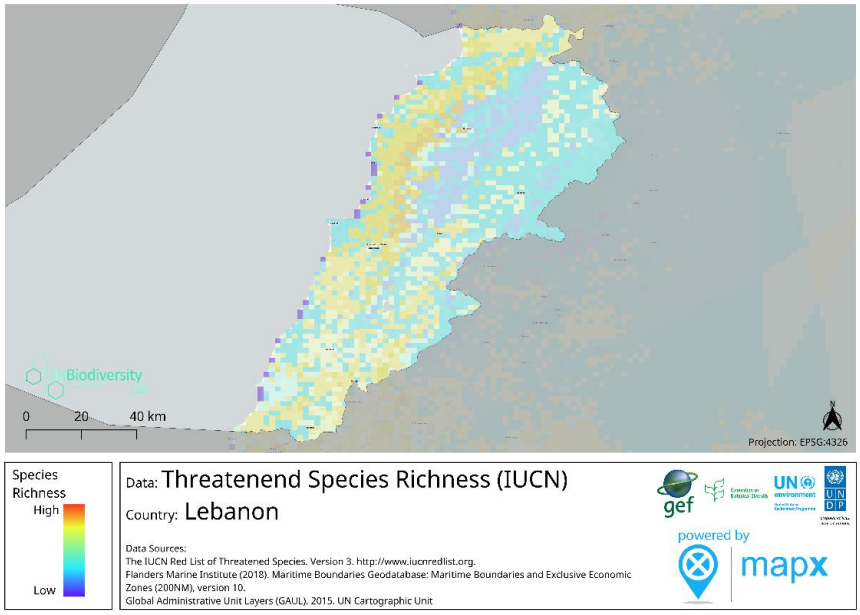


Figure 5 Threatened Species Richness

Source: UN Biodiversity Lab, 2018

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Monitoring activities on national scale are still in the early phase of planning and implementation.

Relevant institutions need to ensure continuous monitoring.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 1.4

NA 1.4: Include threatened species in national conservation strategies and regulations; namely in-situ and ex-situ conservation programs

There is **one** main measure that contributes to the implementation of the NA1.4.

Measure 1.4a: Initiatives towards in situ and ex situ conservation

In situ

- Threatened species existing in current protected areas and protected areas in the process of being declared benefit from in situ conservation measures as part of the protected areas conservation management.

Ex situ

- Ex situ conservation of crop wild relatives and other economically important native plant species is on-going at the Lebanese Agricultural Research Institute (LARI).
- A Cooperative of Native Tree Nurseries was established; the cooperative signed a memorandum of understanding (MOU) with the MoA; the cooperative includes two protected areas, namely Tannourine Cedars Nature Reserve and Ehden Forest Nature Reserve, in addition to Jabal Moussa Biosphere Reserve.

Contributions to ex situ conservation at the private level include:

- Ex situ conservation of crop wild relatives and other economically important native plant species is on-going at the International Center for Agricultural Research in Dry Areas (ICARDA).
- Some endemic species are being genetically characterized and propagated in nurseries by Jozour Loubnan. Some species like *Iris* spp. are also being conserved in situ by USJ and Friends of Nature, Lebanon.
- Initiative to conserve some economically important medicinal and aromatic plants is being undertaken at BAU - Research Center for Environment and Development.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 1 and National Priority Area 1: Threatened Species.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Threatened species in all nature reserves benefit from in situ conservation. While ex situ conservation of crop wild relatives and economically important native plants is ongoing, little emphasis is placed on threatened species. The work of nurseries is focused on native trees, regardless of their conservation status. As such, this measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Threatened species need to be identified and recognized at the national level before they are included in national conservation strategies and regulations.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 1.5

NA 1.5: Develop species-specific conservation legislation and conservation action plans to ensure conservation of important species, particularly endemic/ threatened species.

There is **one** main measure that contributes to the implementation of the NA1.5.

Measure 1.5a: Steps to progressive inclusive legislation for species protection

- To date, there are no major species-specific conservation legislation and conservation action plans. There is one joint action (March 2016) that bans the hunting of the Turtle Dove (*Sterptopelia tutur*) for being threatened at the global level since 2015.
- The Decree #2878 dated 10/1/2016 declaring Ehmej Nature Site under the protection of MoE was issued based on MoE proposal, it aims to establish a microreserve to protect mainly the endemic and threatened species of Iris sofrana, based on the research studies carried out by Bou Dagher Kharrat - USJ.
- The MoE issued Decision #798/1 dated 10/9/2018 banning the hunting of foxes, hyenas and wolves all year long.
- The MoE issued Decisions related to the regulation of hunting which limit hunting to a specific season and for specific species only excluding endemic, rare and threatened species among others (Decision # 449/1 dated 1/6/2017 opening the hunting season for 2017 and defining the game birds and animals allowed for hunting during the season and their bag limits, Decision # 723/1 dated 28/8/2018 opening the hunting season for 2018 and defining the game birds and animals allowed for hunting during the season and their bag limits).
- The MoA issued Decision 179/1, dated 3/3/2012 that controls the harvesting of Wild *Origanum syriacum* and *Salvia fruticosa*.
- A national strategy for the conservation and management of plant genetic resources for food and agriculture (PGRFAs; 2015-2035) was recently developed.
- At the Shouf Biosphere Reserve, the first phase of re-introducing the Nubian Ibex to Lebanon (Phase 1: Fence to Fence) was undertaken.

- More recently, the Directorate General of Antiquities allocated part of a fund to renovate Al Hussami House at the UNESCO World Heritage Site in Byblos for the development and implementation of a vegetation management plan. This management plan was developed by the Nature Conservation Center, American University of Beirut. The plan intends to achieve better conservation of the site, while making it more conducive for the rare Lebanese endemic, *Matthiola crassifolia*.

Additionally, ministerial Decrees for the protection of specific marine species were developed and approved, these include:

- "Prohibiting fishing of whales, seals and marine turtles" (Decree 125/1, 1999)
- General conditions for fishing sharks/seals (Decree 1160/1, 2013)
- Decision prohibiting hunting of marine birds (Decision 396/1, 2014)
- General conditions to protect cetaceans (1144/1, 2014)
- General conditions to catch sharks (1145/1, 2014).

Contributions by academic institutions to species specific conservation actions include:

- Species-specific conservation action plans for two endemic species of *Iris* and one threatened species of *Drosera* in the context of establishing microreserves for the conservation of these plants were carried out (Bou Dagher Kharrat - USJ).
- USJ granted CEPF fund to conserve two endemic spp. (*Iris antilibanotica* and *Astragalus berytheus)* in archaeological sites in Anjar and Tyre in collaboration with the Directorate General of Antiquities (DGA)
- Conservation of the coastal stenoendemic *Matthiola crassifolia* (Itani, Al-Zein and Talhouk -AUB).

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 1 and National Priority Area 1: Threatened Species.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

There are some ministerial decisions that control and ban the harvesting, hunting and fishing of some endemic and threatened species. However, there is a need to issue more species-specific legislation specifically for terrestrial species.

Apart from the national strategy for conservation and management of PGRFAs and the effort undertaken by the Directorate General of Antiquities to conserve one endemic coastal plant species, no conservation action plans that ensure the conservation of important species have been developed at the national level.

Relevant websites, web links and files

- www.agriculture.gov.lb

Other Relevant Information

The effort undertaken by the Directorate General of Antiquities to achieve better conservation of one site, while making it more conclusive for the rare Lebanese endemic *Matthiola crassifolia*, constitutes a good case study.

Some municipalities are undertaking serious initiatives to conserve some patrimonial (historical) areas and species. For instance, Bcheale municipality is conducting conservation action on its historical/monumental olive trees.

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The absence of an updated national checklist of the flora and fauna of the country based on field work at the national level, particularly endemic taxa, and the absence of a national red list are major obstacles that hinder the achievement of this action.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

National Target 1: By 2030, the status of 75% of known flora and fauna species is identified and conservation actions are implemented on 50% of threatened species.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☒ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

Despite the availability of information, no additional resources have been invested by the Lebanese government.

There is a lack in resource availability and lack of experts, such as on freshwater ecosystems. There is a lack of funding that supports these actions from national institutions especially ministries. In addition, more actions need to be taken by the government in this regards.

There is a general deficiency in quantitative data in Lebanon, which hinders the ability to properly assess and evaluate status and trends, this is primarily due to the absence of systematic monitoring due to limited resources.

The Lebanese government needs to officially implement participatory and integrated actions to meet the NT supported by the necessary resources. Information can be extracted from existing scientific publications and officially endorsed. An action plan to meet the target should be developed by the national authority and resources should be secured for implementation.

Indicators used in this assessment

1- Number of species (fauna and flora) listed in the IUCN Red List and national red list
2- Number of data points/records in the national inventory of species
3- Number of species in the seed and gene banks databases
4- Number of related legislation and laws
5- Percent of known flora identified and conservation status assessed
6- Percent of known fauna identified and conservation status assessed
7- Percent of threatened species with conservation actions implemented

Other tools or means used for assessing progress

Indicators were heavily relied on in the assessment of progress towards the NTs, in the cases where the NTs had available information and data on indicators, assessment was easy and straightforward.

In the absence of such information, which is the case for most NTs including NT 1, the main tool used to assess progress towards the NT consisted of desk studies of available information followed by expert discussion and review, which was eventually verified during the stakeholder meetings.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☐ Based on partial evidence

☒ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

1- Number of species (fauna and flora) listed in the IUCN Red List and national red list
Status of Indicator:

- IUCN: Mammals: 15 species; Birds: 28 species; Reptiles: 7 species; Plants: 227 species
- 0 on the national Red List.

Notes:
No official national red list exists for Lebanon yet; however, the national red book of 108 of Lebanon's plant species is being currently prepared, in addition to the red lists that are being developed currently for birds, amphibians and reptiles and which will be published soon.

2- Number of data points/records in the national inventory of species
Status of Indicator: Unknown, no available information
Notes:
The latest national inventory, published in 1996 (Etude de la Diversite Biologique du Liban), needs updating and does not include locations or records. Records exist in natural history museums, herbaria, seed banks, protected areas, and at some ministries (MoA in the context of the SALMA initiative for example), NCRS, LARI and academic institutions, but these records are not part of a national inventory, though they can form the foundation for one.

3- Number of species in the seed and gene banks databases
Status of Indicator: Unknown
Notes:

- 40 endemic species are present in the gene bank of Jozour Loubnan
- 188 spp. of plants are conserved ex situ at the ICARDA seed bank.

- 985 different plant species exist at the National Gene Bank, Lebanese Agricultural Research Institute. No seeds or genes for marine or freshwater species are yet stored in related banks databases.

4- Number of related legislation and laws
Status of Indicator: 5 laws related to biodiversity topics
Notes:
- Animals Protection and Welfare Law was issued in 2017 that takes into account the provisions of the relevant international agreements and recommendations, in particular the Convention on International Trade in Endangered Species of wild Fauna and Flora (CITES) and the World Organization for Animal Health (OIE).
- The Decree #2878 dated 10/1/2016 declaring Ehmej Nature Site under the protection of MoE, it aims mainly to protect the endemic and threatened species of Iris sofrana.
- The MoE Decision #798/1 dated 10/9/2018 banning the hunting of foxes, hyenas and wolves all year long.
- The MoE Decisions related to the regulation of hunting which limit hunting to a specific season and for specific species only excluding endemic, rare and threatened species among others (Decision # 449/1 dated 1/6/2017 opening the hunting season for 2017 and defining the game birds and animals allowed for hunting during the season and their bag limits, Decision # 723/1 dated 28/8/2018 opening the hunting season for 2018 and defining the game birds and animals allowed for hunting during the season and their bag limits).

5- Percent of known flora identified and conservation status assessed:
Status of Indicator: Unknown
Notes:
- Freshwater floral species identified and listed (www.ul.edu.lb)
- Marine and coastal floral species totals updated based on desk research in the SAP BIO 2016 (www.moe.gov.lb).
- Following a request for partnership sent from the Lebanese MOE, Oceana "an international organization focused solely on oceans, carried out in 2016 a deep-sea expedition in Lebanon through "The Deep-Sea Lebanon" Project implemented also in collaboration with the Lebanese National Centre for Marine Research, SPA/RAC, IUCN. More than 600 faunal and floral taxa were identified. Five sites were proposed as MPAs in deep waters within Lebanon's territorial waters further validating the importance of the ELCA:
  - Beirut Escarpment
  - Saint Georges Canyon
  - Jounieh Canyon
  - Sayniq (Saida) Canyon
  - Chekka – Batroun Canyon
- Ecological characterization through biodiversity field surveys were carried out in in 2016 by SPA/RAC in collaboration with the Ministry of Environment in three of the proposed coastal MPAs of Lebanon: Batroun, Medfoun and Byblos. A mixed team of national and international experts from SPA/RAC, the National Center for Marine Sciences of Lebanon-CNRSL, University of Alicante, and IUCN contributed in these field surveys (www.moe.gov.lb; www.rac-spa.org).
- Flora in most PAs are identified and benefit from protection within these PAs.
- More than 200 plant species were assessed using IUCN standards in the context of a CEPF Project.

6- Percent of known fauna identified and conservation status assessed
Status of Indicator: Unknown, no available information
Notes:

- Animals within most PAs are identified and benefit from protection within these PAs.
- Freshwater ichtyofauna re-evaluated and species identified and listed (www.ul.edu.lb) .
- Marine and coastal faunal species totals updated based on desk research in the SAP BIO 2016 (www.moe.gov.lb).
- Fauna in most PAs are identified and benefit from protection within these PAs.
- Cartilaginous fishes studied and listed along the Lebanese coas (www.cnrs.edu.lb).
- Following a request for partnership sent from the Lebanese MOE, OCEANA "an international organization focused solely on oceans, carried out in 2016 a deep-sea expedition in Lebanon, within "The Deep-Sea Lebanon" Project implemented also in collaboration with the Lebanese National Centre for Marine Research, SPA/RAC, IUCN. More than 600 faunal and floral taxa were identified. Five sites were proposed as MPAs in deep waters within Lebanon's territorial waters further validating the importance of the ELCA:
  - Beirut Escarpment
  - Saint Georges Canyon
  - Jounieh Canyon
  - Sainiq (Saida) Canyon
  - Chekka – Batroun Canyon
- Ecological characterization through biodiversity field surveys were carried out in in 2016 by SPA/RAC in collaboration with the Ministry of Environment in three of the proposed coastal MPAs of Lebanon: Batroun, Medfoun and Byblos. A mixed team of national and international experts from SPA/RAC, the National Center for Marine Sciences of Lebanon-CNRSL, University of Alicante, and IUCN contributed in these field surveys (www.moe.gov.lb; www.rac-spa.org).

7- Percent of threatened species with conservation actions implemented
Status of Indicator: Unknown, no available information
Notes:

- A management plan for the caracal at the Shouf Biosphere Reserve was developed by Abi Said.
- 100% of IUCN threatened bird species are legally protected. Status of these species at the national level is not known.
- Decision #798/1 dated 10/9/2018 banning the hunting of foxes, hyenas and wolves all year long.
- Threatened species inside the PAs are protected legally.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

Not applicable.

Relevant websites, web links and files

- www.moe.gov.lb
- www.cnrs.edu.lb
- www.lari.gov.lb
- www.rac-spa.org
- https://oceana.org/
- www.iucn.org
- http://www.pgrfa.org/WIEWS
- www.lebanon-flora.org

NATIONAL TARGET 2

Section I - Information on the targets being pursued at the national level

National Target

National Target 2: By 2030, the genetic diversity of 50% of important native fauna and flora is conserved *in-situ* and *ex-situ*

Rationale

The conservation of native species in situ and ex situ will guarantee the preservation of genetic diversity of species and their potential as national resources for ecosystem functioning, ecological restoration and future generations.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☒ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 2: Genetic Diversity.

Relevant websites, web links and files

- http://www.pgrfa.org/WIEWS
- www.lebanon-flora.org

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

National Target 2: By 2030, the genetic diversity of 50% of important native fauna and flora is conserved *in-situ* and *ex-situ*

National Actions

National Actions for National Target 2:

National Action 2.1: Build on the results of National Actions 1.1 and 1.2 to extract the list of endemic and economically important species (such as medicinal plants, aromatic plants, wild relatives, etc.) and their conservation status

National Action 2.2: Conduct monetary valuations of endemic and economically important species

National Action 2.3: Create a GIS database mapping existing endemic and economically important species geographical location and extent

National Action 2.4: Include endemic and economically important species in national conservation strategies and regulations; namely in-situ and ex-situ conservation programs (gene banks and on farm)

National Action 2.5: Adopt the outcomes of the Mainstreaming Biodiversity Management into Medicinal and Aromatic Plants project and expand it to encompass other economically important species

Measures Taken to contribute to the implementation of NA2.1

National Action 2.1: Build on the results of National Actions 1.1 and 1.2 to extract the list of endemic and economically important species (such as medicinal plants, aromatic plants, wild relatives, etc.) and their conservation status.

There is **one** main measure that contributes to the implementation of the NA2.1.

Measure 2.1a: National initiatives to identify endemic and economically important species

- The MoA developed a list of the most important varieties of stone fruits and pome fruits in Lebanon.
- There is also an ongoing project aiming at studying the geographic distribution and conserving ten crop wild relatives in Lebanon (CWR reports).
- The NCMS-CNRS are partners in the project" DNA Identification and Authentication of Mediterranean Fisheries Resources". The aim is to share knowledge and expertise on molecular analysis tools applied to marine resources and seafood authentication (www.cnrs.edu.lb).
- LARI conducted several projects to identify many species of wild relatives ex. *Pyrus syriaca, Rubus spp and Capparis spinosa.*
- There is an ongoing effort to conduct monetary valuation of economically important plant species at the Shouf Nature Reserve.
- Some Masters theses contribute to the achievement of this national target; for instance, a thesis completed by El Assaad (2015) at the Lebanese University tackled the economic valorization of *Capparis spinosa* in Lebanon in light of its medicinal properties.
- There is ongoing work on Melia azedarach by Abou Fakher (LU).

On the other hand, contributions from private initiatives and academic institutions to identify endemic and economically important species include:

- An updated list of medicinal plants of Lebanon was compiled by Karam et al. (2016).
- Work was carried out on the flora of Mount Hermon with emphasis on medicinal plants (Baydoun et al. 2015 and Arnold et al. 2015)
- Several published papers that contribute to the achievement of this national action (Beyrouthy -USEK) include:
    - Essential oils composition and antimicrobial activity of six conifers harvested in Lebanon.
    - *Capparis spinosa* L.: A Xerophilous Species of Multi Values and Promising Potentialities for Agrosystems under the Threat of Global Warming.
    - Chemical diversity and antimicrobial activity of the essential oils of four Apiaceae species growing wild in Lebanon.
    - Isolation and characterization of santolinoidol, a bisabolene sesquiterpene from Achillea santolinoides subsp wilhelmsii (K. Koch)
    - Chemical Diversity and Antimicrobial Activity of *Salvia multicaulis* Vahl Essential Oils.
    - Report on the medicinal use of eleven Lamiaceae species in Lebanon and rationalization of their antimicrobial potential by examination of the chemical composition and antimicrobial activity of their essential oils.
    - Chemical composition and antimicrobial activity of *Satureja*, *Thymus* and *Thymbra* species grown in Lebanon
    - Chemometric tools to highlight the variability of the chemical composition and yield of Lebanese *Origanum syriacum* L. essential oil
    - Chemical Composition and Antimicrobial Activity of *Origanum libanoticum*, *Origanum ehrenbergii* and *Origanum syriacum* Growing Wild in Lebanon
    - Chemical Composition of the Essential Oil of *Satureja myrtifolia* (Boiss. & Hohen.) from Lebanon
    - Seasonal variation in yield and composition of essential oil from *Satureja cuneifolia* Ten. growing wild in Lebanon.
    - Chemical composition of the essential oils from (berries, leaves and twigs) of *Juniperus excelsa* M. Bieb. growing wild in Lebanon
    - In vitro propagation of *Origanum syriacum* and *Origanum ehrenbergii*.
- A study about plant endemic species is in progress by Dr. Bou Dagher Kharrat et. al (USJ).
- A checklist of the crop wild relatives of Lebanon is being compiled by Yazbek (International Center for Agricultural Research in Dry Areas).
- There is ongoing work on biopesticide from bacteria by Dr. Kallasy (USJ).
- A study has been published on the chemical composition of venom from Montevipera bornmulleri (Accary et al., 2016)

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 2 and National Priority Area 2: Genetic Diversity.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness.

The methodology followed for the assessment of effectiveness of each measure considered for the implementation of the NAs is related to the degree of implementation of the measure at the national level or endorsed by a governmental institution such as the MoE or MoA. Whereby:

- If the measure was completely implemented or actively under implementation then it was considered effective;
- If the measure was at the planning stage or early implementation then it was considered partially effective;
- It the measure's implementation did not start yet, then it was considered ineffective; and
- If there are no tangible information on the implementation of the measure, then its effectiveness if considered unknown.

This measure was implemented partially by the concerned public institutions but most of the contribution is from academic work. Therefore, this measure is considered partially effective.

No major changes to government policies, or changes in the behaviour of major sectors in the country were witnessed.

Relevant websites, web links and files

- www.agriculture.gov.lb
- www.cnrs.edu.lb
- Accary, C., Hraoui-Bloquet, S., Sadek, R., Alameddine, A., Fajloun, Z., Desfontis, J. C., & Mallem, Y. (2016). The relaxant effect of the Montivipera bornmuelleri snake venom on vascular contractility. *Journal of venom research*, *7*, 10.
- Al Hafi Monay, Arnold Nelly, Bouez Jocelyne, Fabrice cazier, Antoine Aboukais, BeyrouthyMarc. Chemical composition of the essential oils from (berries, leaves and twigs) of Juniperus excelsa M. Bieb. growing wild in Lebanon. Journal of essential oil bearing plants 2013. (ID: 901626 DOI:10.1080/0972060X.2014.901626)
- Arnold N, Baydoun S, Chalak L, Raus Th (2015) A contribution to the flora and ethnobotanical knowledge of Mount Hermon, Lebanon. Fl. Medit. 25: 13-55.
- Baydoun S, Chalak L, Arnold-Apostolides N (in press) Indigenous multipurpose shrubs of Lebanon, a rich resource for benefits and economic development in rural communities.
- Baydoun S., Kanj D., Raafat K., Aboul Ela M., Chalak L. and Arnold-Apostolides N. (2017) Ethnobotanical and Economic Importance of Wild Plant Species of Jabal Moussa Bioreserve, Lebanon. J Ecosys Ecograph, S7. 10 pp. DOI: 10.4172/2157-7625.S7-001
- BAYDOUN S, CHALAK L, DALLEH H, ARNOLD N (2015). ETHNOPHARMACOLOGICAL SURVEY OF MEDICINAL PLANTS USED IN TRADITIONAL MEDICINE BY THE COMMUNITIES OF MOUNT HERMON, LEBANON. JOURNAL OF ETHNOPHARMACOLOGY 173: 139-156.
- Chalak L, S.A. Baydoun and A.A. Jaradat (in press) Genetic resources of Fruit Trees in the Fertile Crescent: a hotspot heritage.
- Chalak L, Baydoun S, and Tous J (in press) Back to underutilized fruit crops in some East Mediterranean countries along the Silk Roads to cope with future challenges.
- Chalak L, Youssef A, Hamadeh A, Khadari B, El Riachy M (2018) Preliminary assessment of centennial olive trees in Lebanon indicates a high potential for selection. Acta Hortic. 1199: 33-40.
- Chalak L (2018) Proposed regulations on access and benefit-sharing for biological and genetic resources of Lebanon. http://www.fao.org/fi/staticmedia/MeetingDocuments/AqGenRes/ITWG/2018/Inf8e.pdf
- Chalak L, Touma JA, Touma S, Rahme S, Azzi R, Guiberteau F (2016) Assessment of the Lebanese grapevine germplasm reveals a substantial diversity and a high potential for selection. BIO Web of Conferences 7 (01020). DOI: 10.1051/bioconf/20160701020
- Chalak L., Haouane H., Essalouh L., Santoni S., Besnard G. and Khadari B (2015) Extent of the genetic diversity in Lebanese olive (Olea europaea L.) trees: a mixture of an ancient germplasm with recently introduced varieties. Genet Resour Crop Evol 62 (4): 621-633
- Chalak L, Mzid R, Rizk W, Hmedeh H, Kabalan K, Breidy J, Hamadeh B, Machlab H, Rizk H, Elhajj S (2015) Performance of 50 Lebanese barley landraces (Hordeum vulgare L. subsp.

vulgare) in two locations under rainfed conditions. Annals of Agricultural Science 60(2): 325-334.

- El-Hajj S, Dib D, Chalak L, Rizk H (2015) Yield Stability and Quality of Durum Wheat Genotypes in Different Environments of Lebanon. Gene Conserve 14 (57): 52-74.
- Chalak L and Hamadeh B (2015) Almond wild relatives in Lebanon: distribution, uses and main threats. Acta Hort. 1074: 43-48.
- Chalak L., Elkhawand H. and Elbitar A. (2014) In vitro regeneration of centennial olive trees (Olea europaea L.). Acta Hortic. 1057, 737-740. DOI: 10.17660/ActaHortic.2014.1057.94
- Chedraoui S, Abi-Rizk A, El-Beyrouthy M, Chalak L, Ouaini N, Rajjou L. Capparis spinosa L. in A Systematic Review: A Xerophilous Species of Multi Values and Promising Potentialities for Agrosystems under the Threat of Global Warming. Front Plant Sci. 2017 Oct 25;8:1845. doi: 10.3389/fpls.2017.01845.
- Chehade Ali, Ibrahim Fatima , Jebawi Fatima, 2018. Diversity of wild Pyrus syriaca in Bekaa and Mount Lebanon regions, Lebanon. LARI report.
- Dandachi F, Hamadeh B, Youssef H, Chahine H, Chalak L (2017) Diversity assessment of the Lebanese germplasm of pomegranate (Punica granatum L.) by morphological and chemical traits. Annals of Agriculture Science 62: 89–98.
- Fahed L., Khoury M., Stien D., Ouaini N., Eparvier V., El Beyrouthy M. Essential oils composition and antimicrobial activity of six conifers harvested in Lebanon. Chemistry & Biodiversity. 2017 Feb;14(2). doi: 10.1002/cbdv.201600235. http://onlinelibrary.wiley.com/doi/10.1002/cbdv.201600235/abstract
- Layal Fahed, Marc El Beyrouthy, Naïm Ouaini, Véronique Eparvier, Didier Stien. Isolation and characterization of santolinoidol, a bisabolene sesquiterpene from Achillea santolinoides subsp wilhelmsii (K. Koch) Greuter. Tetrahedron Letters. 2016-04-03. Volume 57, Issue 17, 27 April 2016, Pages 1892–1894. http://dx.doi.org/10.1016/j.tetlet.2016.03.059.
- Layal Fahed, Marc El Beyrouthy, Naïm Ouaini, Véronique Eparvier, Didier Stien. Isolation and Characterization of Santolinoidol, a Bisabolene Sesquiterpene from Achillea santolinoides Subsp wilhelmsii (K. Koch) Greuter. ChemInform 47(32) • July 2016. DOI: 10.1002/chin.201632200
- Layal Fahed, Didier Stien, Naïm Ouaini, Véronique Eparvier, Marc El Beyrouthy. Chemical Diversity and Antimicrobial Activity of Salvia multicaulis Vahl Essential Oils. Chemical Diversity and Antimicrobial Activity of Salvia multicaulis Vahl Essential Oils. Chemistry and Biodiversity (Reg. No. C15332). Volume 13, Issue 5, May 2016, Pages: 591–595 DOI: 10.1002/cbdv.201500332.
- Madona Khoury, Didier Stiena, Véronique Eparvier, Naïm Ouaini, Marc El Beyrouthy. Report on the medicinal use of eleven Lamiaceae species in Lebanon and rationalization of their antimicrobial potential by examination of the chemical composition and antimicrobial activity of their essential oils. Journal of Alternative and Complementary Medicine. Volume 2016 (2016), Article ID 2547169, 17 pages - http://dx.doi.org/10.1155/2016/2547169
- Madona Khoury, Marc El Beyrouthy, Véronique Eparvier, Naïm Ouaini & Didier Stien. Chemical diversity and antimicrobial activity of the essential oils of four Apiaceae species growing wild in Lebanon. Journal of Essential Oil Research. Volume 30, 2018 - Issue 1 Pages 25-31
- Monay Al Hafi, Marc El Beyrouthy, Naim Ouaini, Didier Stien, Douglas Rutledge, Sylvain Chaillou. Chemical composition and antimicrobial activity of Satureja, Thymus and Thymbra species grown in Lebanon. Chemistry and Biodiversity. 2016. DOI: 10.1002/cbdv.201600236.
- Mzid R., Chibani F., Ben Ayed R., Hanana M., Breidi J., Kabalan R., El-Hajj S., Machlab H., Rebai A. and Chalak L. (2016) Genetic diversity in barley landraces (Hordeum vulgare L. subsp. vulgare) originated from Crescent Fertile region as detected by seed storage proteins. Journal of Genetics 95. DOI 10.1007/s12041-016-0683-5
- Monay Al Hafi, Marc El Beyrouthy, Naim Ouaini, Didier Stien, Douglas Rutledge, Sylvain Chaillou. Chemical Composition and Antimicrobial Activity of Origanum libanoticum, Origanum ehrenbergii and Origanum syriacum Growing Wild in Lebanon. Chemistry and Biodiversity. (Reg. No. C15178). Volume 13, Issue 5, May 2016, Pages: 555–560, doi: 10.1256/cbdv.201300569.
- Bachar zebib, Marc El Beyrouthy, Carl Safi & Othmane Merah. 2014. Chemical Composition of the Essential Oil of Satureja myrtifolia (Boiss. & Hohen.) from Lebanon. Journal of Essential Oil Bearing Plants. (ID: 890075 DOI:10.1080/0972060X.2014.890075).

- Redwan Z, Baydoun S, Naser H, Chalak L, Arnold-Apostolides N (in Press) Socioeconomic Importance of Some High Value Wild Medicinal Plants From Lebanon.
- Marc El Beyrouthy, Antoine Abou-kaïs, Fabrice Cazier & Nelly Apostolides. 2014. Seasonal variation in yield and composition of essential oil from Satureja cuneifolia Ten. growing wild in Lebanon. Journal of Essential Oil Bearing Plants (ID: 901603 DOI:10.1080/0972060X.2014.901603)
- M. El Beyrouthy, G. Elian, C. Abou Jaoudeh and L. Chalak. In vitro propagation of Origanum syriacum and Origanum ehrenbergii. Acta Horticulturae, 2015. ISHS Acta Horticulturae 1083. VIII International Symposium on In Vitro Culture and Horticultural Breeding. http://www.actahort.org/books/1083/
- Hany Kallassy, Mohammad Fayyad-Kazan, Rawan Makki, Yolla EL-Makhour, Hassan Rammal, David Y. Leger, Vincent Sol, Hussein Fayyad-Kazan, Bertrand Liagrem Bassam Badran. Chemical Composition, Antioxidant, Anti- Inflammatory, and Antiproliferative Activities of the Plant Lebanese Crataegus azarolus L. Medical Science Monitor Basic Research, 2017; 23: 270-284.
- Hany Kallassy, Mohammad Fayyad-Kazan, Rawan Makki, Yolla EL-Makhour, Eva Hamade, Hassan Rammal, David Y. Leger, Vincent Sol, Hussein Fayyad-Kazan, Bertrand Liagrem Bassam Badran.Chemical Composition and Antioxidant, Anti- Inflammatory, and Antiproliferative Activities of Lebanese Ephedra Campylopoda Plant. Medical Science Monitor Basic Research, 2017; 23: 313-325
- Ghassan Nasser, Abbas Sabbah, Naiim Chokeir, Akram Hijazi, Hassan Rammal, May Issa. Chemical composition and antioxidant capacity of Lebanese molasses pomegranate. American Journal of PharmTech Research 2017; 7(4): 191-204.
- Abbas Sabbah, Mohamad Nasser, Falah As-sadi, Akram Hijazi, Hassan Rammal, Ghassan Nasser. Chemical composition and antioxidant activity of Lebanese Punica granatum peels. International Journal of Pharma Research and Health Sciences, 2017; 5 (1): 1552-1557.
- Abbas Sabbah, Mohamad Nasser, Akram Hijazi, Hassan Rammal, Ghassan Nasser. Phytochemical screening and cytotoxic activity of two extracts from seeds of Lebanese Annona squamosa L. International Journal of Pharma Research and Health Sciences, 2017; 5 (1): 1586-1591.
- Nasser Mohamad, El-Mestrah Majid, As-sadi Falah, Cheaito Layla, Hijazi Akram, Chokr Ali, Rammal Hassan. Antibacterial, antioxidant and antiproliferative activities of the hydroalcoholic extract of the Lebanese Annona squamosa L. seeds. International Research Journal of Pharmacy, 2017, 8(1).
- Akram Hijazi, Abbas Sabbah, Falah As-Sadi, Sara Zeiter, Hassan Rammal and Mohamad Nasser. Antioxidant, Antiproliferative Properties and Chemical Composition of the Ethanolic Extract from Leaves and Stems of Lebanese Anacyclus nigellifolius Boiss. Journal of Advances in Medical and Pharmaceutical Sciences, 2016, 11(4): 1-9.
- Nasser Mohamad, As-sadi Falah, Jaafar Fatima, Kanaan Hussein, Hijazi Akram, Chokr Ali, Rammal Hassan. Antibacterial, antioxidant and antiproliferative activities of the hydroalcoholic extract of the Lebanese plant: "Ephedra campylopoda". International Research Journal of Pharmacy, 2016, 7(12).
- Raghida Damaj, Abbas Sabbah, Ghassan Nasser, Mira Bou Francis, Akram Hijazi, Hussein Annan, Abd-Al-Ameer Al Rekaby, Hassan Rammal. Antioxidant activity and chemical composition of the ethanolic extract from leaves and stems of the Lebanese Eryngium creticum. Journal of Multidisciplinary Engineering Science and Technology, 2016, 3(11):5813-5823.
- Bouchra Sayed-Ahmad, Akram Hijazi, Houssein Bazzi, Hassan Rammal, Ali el Bazzal, Houssein Annan. Determination Of Bioactive Molecules And Antioxidant Activity In Stinging Nettle (Urtica Dioica). Journal of Multidisciplinary Engineering Science and Technology, 2015; 2(10): 2753-2758.
- Saeed Zeidan, Akram Hijazi, Hassan Rammal, Ali Al Bazzal, Hussein Annan, and Abd Al-Ameer N. Al-Rekaby. Determination of bioactive compound content and antioxidant activity of the Lebanese Eryngium creticum L. European Chemical Bulletin, 2015, 4(11), 498-502.
- Makki R, Dirani ZE, Rammal H, Sweidan A, Al bazzal A and Ali Chokr. Antibacterial Activity of Two Lebanese Plants: Eryngium creticum and Centranthus longiflorus. Journal of Nanomedicine and Nanotechnology 2015, 6(5).

- Hassan Rammal, Hussein Farhan, Nadia Jamaleddine, Majid El Mestrah, Mohamad Nasser and Akram Hijazi. Effects of altitude on the chemical composition and on some biological properties of Lebanese Eryngium creticum L. Journal of Chemical and Pharmaceutical Research, 2015, 7(6):887-893.
- Rawan Makki, Hassan Rammal, Hussein Farhan, Mohamad Nasser, Zeinab El Dirani, Akram Hijazi, Bassam Badran. The antioxidant and anti-tumor activities of the Lebanese Centranthus longiflorus L. World Journal of Pharmaceutical Sciences 2015; 3(2): 158-367.
- Hussein Farhan, Hassan Rammal, Akram Hijazi, Houssein Annan, Ahmad Daher, Mohamad Reda and Bassam Badran. Chemical composition, in vitro cytotoxicity and anti-free radical properties of six extracts from Lebanese Trigonella berythea Boiss. Pakistan Journal of Pharmaceutical Science 26(6), 2013, 1157-1163

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

National actions 1.1 and 1.2 are still in the planning stage or early implementation.

It is recommended that the MoE and/or MoA establish a national initiative to launch field surveys for the purpose of updating the national inventory. This update could include data acquired from academic and scientific research. The completion of NA 1.1 and 1.2 would affect the implementation of NA 2.1.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 2.2

National Action 2.2: Conduct monetary valuations of endemic and economically important species

There are **two** measures that contribute to the implementation of the NA 2.2.

Measure 2.2a: Valuating endemic and economically important terrestrial species

No measures have been undertaken at the national level. Some contribution from academic institutions include:

- Work on the monetary valuations of endemic and economically important species of Jabal Moussa Biosphere Reserve by Baydoun (Beirut Arab University), Arnold (USEK) and Chalak (Lebanese University).

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 2 and National Priority Area 2: Genetic Diversity.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☒Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is considered ineffective since minimal work has been done.

Relevant websites, web links and files

- Baydoun SA, Kanj D, Raafat K, Aboul Ela M, Chalak L, et al. (2017) Ethnobotanical and Economic Importance of Wild Plant Species of Jabal Moussa Bioreserve, Lebanon. J Ecosys Ecograph S7: 001. doi: 10.4172/2157-7625.S7-001

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Initiatives need to be well-coordinated to cover a wider variety of species on a national scale.

National economic valuation methods for economically important species should be standardized.

Relevant websites, web links and files

-

Measure 2.2b: Conduct monetary valuations of endemic and economically important marine species

Contribution to the implementation of this measure include efforts at both levels institutional (MoA, NCMS, etc.) and private (academia, NGOs,):

- National Fisheries Dependent Data Collection Program: the FAO-East Med Project (www.faoeastmed.org) funded by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with the MoA in Lebanon supported an agreement with the MCR-IOE-UOB to initiate a "Pilot Survey on Fisheries Dependent Data Collection in Lebanon Including Training" that was implemented in 2013-2014. The MCR-IOE-UOB contributed to improve and implement that through the expansion of the original fisheries Catch/Effort monitoring utility FLOUCA into FLOUCA Web. Lebanon has sent the first official national fisheries report to the FAO in 2014 based on obtained results from the "National Fisheries Dependent Data Collection Program". FLOUCA Web is currently being used by the MoA as the system for reporting catch/effort data to the FAO and GFCM. Since then and to date, information about fishing gear, species, quantity, price and size is collected regularly for commercial species from the major fishing ports in Lebanon.
- A socio-economic study held under the FAO-EastMed Project in partnership with the MoA showed that fishing in Lebanon is a family-based activity. There is a non-aging fishers' population, and mainly fishermen have a low level of education. The income per fisher-owner (7,400 USD) and fisher (3,000 USD) is 20% and 70% respectively less than the national Gross Domestic Product (GDP) per capita. Furthermore a fisher earns about 25% less than the minimum wage of the country. Fishers in Lebanon are part of the poorest section of the society while certain fisher-owners are present in the lower-middle class. Most of the fish catch is sold fresh on auction markets (www.faoeastmed.org).

At the academic levels, contributions include:

- Monitoring Catch/Effort of commercial fish species in North Lebanon by the MCR-IOE-UOB: In 2006, the MCR-IOE-UOB initiated a catch/effort data collection program of commercial fisheries for the Mohafaza (Governorate) of North Lebanon and Akkar, covering approximately 45% of the Lebanese coastline. Since then and to date, information about fishing gear, species, quantity, price and size is collected on a weekly basis for commercial species from the four major ports in North Lebanon: Batroun, Qalamoun, Tripoli and Abdeh.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 2 and National Priority Area 2: Genetic Diversity.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is actively under implementation as such it is considered partially effective. Moreover, support from the FAO-EastMed project is provided for an updated socio-economic study of the sector.

Relevant websites, web links and files

- www.faoeastmed.org
- www.agriculture.gov.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The National Fisheries Dependent Data Collection Program, which lists the amounts of fisheries capture and estimated valuations, is adopted by the Ministry of Agriculture but not yet officially adopted by the Lebanese Government.

A national list of economically important fish and marine species that is endorsed by the government does not exist.

Initiatives need to be well-coordinated to cover a wider variety of species on a national scale.

National economic valuation methods for economically important species should be standardized.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 2.3

National Action 2.3: Create a GIS database mapping existing endemic and economically important species geographical location and extent

There are **two** main measures that contribute to the implementation of the NA1.3.

Measure 2.3a: Initiatives to mapping terrestrial endemic and economically important species

- An application (iSpotNature) was developed by the Lebanese National Council for Scientific Research (CNRS-L) and Observatoire Libano-Français de L'Environnement (O-LiFE) to enable data collection on biodiversity through a public participatory approach.
- Passport data exists for each accession at the national seed bank (LARI)

At the academic level, the following activities were carried out:

- Lebanon Flora provides maps for the distribution of native plant species in Lebanon.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 2 and National Priority Area 2: Genetic Diversity.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Though an application for data collection on biodiversity through a public participatory approach has been developed by CNRS-L and O-LiFE, the database is still non-existent. However, Lebanon Flora provides maps with individual distribution points for endemic species. LARI has passport data for all accessions of economically important and some endemic spp. held at the gene bank.

Relevant websites, web links and files

- http://www.lebanon-flora.org

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The absence of an updated national list of endemic and economically important species limits the implementation of this national action.

Initiatives are still limited.

There is a lack in governmental resources and funding that focus on building a national geo-database on biodiversity.

Centralize spatial data and continuously expand and update from relevant studies and academic work.

Relevant websites, web links and files

-

Measure 2.3b: Initiatives to mapping marine endemic and economically important species

- CARLIT Index methodology was adopted and applied by the team of the NCMS-CNRS: allowed the collection of accurate information on the distribution and abundance of shallow-water macroalgal assemblage and their related geomorphological features along 164Km of the Lebanese shorelines, and mapping the obtained info on related maps (e.g. Cystoseira forests).

At the academic level, the following activities were carried out:

- Mapping remaining dendropoma formations or "Vermetid Platforms" in Lebanon: A thesis study held in 2017 at the University of Balamand to assess the species biodiversity at the coastline of Berbara and to map the remaining sites of "Vermetid Platforms" in Lebanon using aerial and satellites imagery. It is considered as a baseline data for future initiatives.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 2 and National Priority Area 2: Genetic Diversity.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Measure is in the early stages of implementation as such it is considered partially effective.

Relevant websites, web links and files

- www.cnrs.edu.lb
- www.balamand.edu.lb
- Badreddine, A., Abboud-Abi Saab, M., Gianni, F., Ballesteros, E., Mangialajo L. First assessment of the Ecological Status in the Levant Basin: application of the CARLIT index along the Lebanese coastline. Ecological Indicators - 85 (2018): 37-47.

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The absence of an updated national list of endemic and economically important species limits the implementation of this national action.

Initiatives are still limited.

There is a lack in governmental resources and funding that focus on building a national geo-database on biodiversity.

Centralize spatial data and continuously expand and update from relevant studies and academic work.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 2.4

NA 2.4: Include endemic and economically important species in national conservation strategies and regulations; namely in-situ and ex-situ conservation programs (gene banks and on farm)

There is **one** main measures that contribute to the implementation of the NA 2.4

Measure 2.4a: Regulating the use of endemic and economically important species

- Scattered and occasional inclusions occur. Regulations protect species of birds of economic value (birds that benefit agriculture for instance).
- The MoE issued Decision #798/1 dated 10/9/2018 banning the hunting all year long of three native species: foxes, hyenas and wolves.

- The conservation plan of the National Gene Bank at the Lebanese Agricultural Research Institute (LARI) aims at conserving the triple E plants (Endemic, of Economic value and Edible) in addition to wild relatives of crops known to have originated in the Fertile Crescent (Wheat, Barley, Oat, Chickpeas, Lentils etc.)
- Ecosystem Approach to Fisheries in Lebanon - Purse Seine Sardine Fisheries: the FAO-EastMed and the MCR-IOE-UOB implemented a pilot case study on the Ecosystem Approach to Fisheries in Lebanon targeting the purse seine fishery. Purse seining fishing mainly sardines reveals higher CPUE and incomes than other fishing gears and have significant economic values. A management plan for the purse seine fishery in collaboration with, and for the benefit of the MoA was produced using the participatory approach (www.faoeastmed.org). The management plan is yet to be endorsed by the related authorities.
- National strategy on PGDFA approved by MoA.
- All endemic and economically important species inside the PAs are protected legally.

Contributions from private initiatives and NGOs include:

- The Jozour Loubnan seed bank aims at conserving accessions of endemic plant spp.
- ICARDA seed bank aims at conserving accessions of crop wild relatives and economically important plant species.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 2 and National Priority Area 2: Genetic Diversity.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Measure is in the early stages of implementation as such it is considered partially effective.

Relevant websites, web links and files

-

Other Relevant Information

Inclusions of endemic and economically important species in national conservation strategies are scattered and occasional. The conservation plan of the National Gene Bank focuses on the conservation of triple E plants and wild relatives of crops ex situ only. There are concrete achievements in ex situ conservation of economically important spp. and endemics in "seed banks"; however, no significant work on animal species has been undertaken.

The national strategy for the conservation and management of plant genetic resources is a promising step towards successful conservation of economically important plant spp.

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The absence of an updated national list of endemic and economically important species limits the implementation of this national action.

Apart from endemic and economically important plant species that are present at nature reserves, no national effort is being undertaken to protect such plants in-situ.

Animal conservation efforts at the national level are generally lacking, except for the species that are legally prohibited for hunting.

Development of an updated national list of endemic and economically important species is crucial.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 2.5

NA 2.5: Adopt the outcomes of the Mainstreaming Biodiversity Management into Medicinal and Aromatic Plants project and expand it to encompass other economically important species

There is **one** main measures that contribute to the implementation of the NA 2.5

Measure 2.5a: Mainstreaming Biodiversity management of MAPs

A ministerial decision (Decision 340/1, 1/8/1996 issued by the MoA) and laws controlling the harvesting and export of Origanum syriacum and Salvia fruticosa have been issued. More recently, the MoA issued Decision 179/1, dated 3/3/2012 that controls the harvesting of Origanum syriacum and Salvia fruticosa.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 2 and National Priority Area 2: Genetic Diversity.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

While a ministerial decision was taken to protect two economically important species and regulate their sustainable harvesting, marketing and export, no national effort has been undertaken to expand the outcomes of this project to encompass other economically important species. As such, the complete desired outcome has not yet been achieved and this measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

Monographs of seven endemic medicinal and aromatic spp. were published.

Lebanese Standards for *Origanum syriacum* mixes have been approved by LIBNOR (2018).

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

While a ministerial decision was taken to protect two economically important plant species, no national effort has been undertaken to expand the outcomes of this project to encompass other economically important species and regulate their sustainable harvesting, marketing and export.

Ministerial decisions to protect all identified economically important species to ensure sustainability should be developed and endorsed.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

National Target 2: By 2030, the genetic diversity of 50% of important native fauna and flora is conserved *in-situ* and *ex-situ*

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☒ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

The update list of the 1996 biodiversity national inventory and development of criteria for the evaluation of conservation status for identified flora and fauna and evaluate the status of the species in the updated inventory should become a priority.

Indicators used in this assessment

1- Number of species in the seed and gene bank databases
2- Quantity of local species sold in local markets
3- Number of revised policies and laws related to conservation of endemic and economically important species
4- Percent of economically important fauna with conservation of their genetic diversity ensured (through in-situ and ex-situ measures)
5- Percent of economically important flora with conservation of their genetic diversity ensured (through in-situ and ex-situ measures)
6- Percent of endemic fauna with conservation of their genetic diversity ensured (through in-situ and ex-situ measures)
7- Percent of endemic flora with conservation of their genetic diversity ensured (through in-situ and ex-situ measures)

Other tools or means used for assessing progress

Indicators were heavily relied on in the assessment of progress towards the NTs; in the cases where the NTs had available information and data on indicators, assessment was easy and straightforward. In the absence of such information, the main tool used to assess progress towards the NT consisted of desk studies of available information followed by expert discussion and review, which was eventually verified during the stakeholder meetings and workshops.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☐ Based on partial evidence

☒ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

Since there is little to no data and information on the indicators to assess progress towards NT2 whereby the assessment draws heavily on expert opinion, the level of confidence of this assessment is based on limited evidence.

1- Number of species in the seed and gene bank databases
Status of Indicator:

- 40 endemic species are present in the gene bank of Jozour Loubnan
- 188 spp. of plants are conserved ex situ at the ICARDA seed bank.
- 985 different plant species exist at the National Gene Bank, Lebanese Agricultural Research Institute.

Notes:

- More than 1300 plant taxa (including subspecies, varieties, unidentified species, etc.) are listed from Lebanon in Genesys (https://www.genesys-pgr.org/welcome).

2- Quantity of local species sold in local markets
Status of Indicator:

- Annual quantities for fisheries by species exist at MoA
- Annual quantities for *Origanum syriacum* and *Salvia fruticosa* might be available at the MoA through harvesting permits

Notes:

- Fisheries sector Catch and Effort data available for all Lebanon starting 2014 (Directorate of Fisheries and Wildlife -MoA).

3- Number of revised policies and laws related to conservation of endemic and economically important species
Status of Indicator: 2 revised policies and laws

- Purse Seine Sardine Fisheries Management Plan elaborated for the benefit of the MoA based on Ecosystem Approach to Fisheries (www.faoeastmed.org)
- National Strategy on PGRFA (Approved/adopted by MoA)

Notes:

The following draft legislation that leads to the conservation of biodiversity in general including conservation of endemic and economically important species were submitted from MoE to the CoM and Parliament:

- Draft Protected Areas Framework Law
- Draft Law on Access and Benefit sharing
- Draft decree on biosafety
- Decisions related to the regulation of hunting which limit hunting to a specific season and for specific species only excluding endemic, rare and threatened species among others (Decision # 449/1 dated 1/6/2017 opening the hunting season for 2017 and defining the game birds and animals allowed for hunting during the season, Decision # 723/1 dated 28/8/2018 opening the hunting season for 2018 and defining the game birds and animals allowed for hunting during the season), Decision # 798/1 dated 10/9/2018 banning the hunting of foxes, hyenas and wolves all year long.
- Draft law on Integrated Coastal Zone Management
- On-going work to declare new PAs:
    - Dinniyyeh, North Lebanon and Jabal Rihan, South Lebanon: The file is at the final stages of approval at the Parliament.
    - Ras El Chakaa, North Lebanon and Abbassiyeh, South Lebanon (Marine PAs): the file was submitted by MoE to the CoM.
    - Nmayriyyeh, South Lebanon, Andaket, North Lebanon, and Rachayya el Wadi, Bekaa: The file was finalized by MoE, and will soon be submitted to the CoM.
    - Zibquine, Sarada, Rachayya el Fakhkhar and Yaroun, South Lebanon, and Ejdebrin, North Lebanon: The file is under preparation (MoE; waiting for more documents regarding land ownerships and maps).
    - Qammouaa, North Lebanon: The case is awaiting the approval of the concerned municipalities. The file is in preparation.
    - Jounieh deep sea MPA: the draft law and whole file was finalized by MoE, IUCN, SPA/RAC and Oceana and will be submitted to the CoM soon.

Furthermore, Draft law on the management of plant genetic resources for food and agriculture in Lebanon was submitted by MoA to the CoM.

4- Percent of economically important fauna with conservation of their genetic diversity ensured (through in-situ and ex-situ measures)
Status of Indicator: Unknown, no available information
Notes:

- Listing of top commercial fish species following reports of the DFW-MoA but ensuring genetic diversity still lacking (Annual DFW-MoA reports).

5- Percent of economically important flora with conservation of their genetic diversity ensured (through in-situ and ex-situ measures)
Status of Indicator: Unknown, no available information

Notes:

- Knowledge on genetic diversity of many economically important flora (Carob, olive, almonds, wild pears and pomegranates) exists. Seed of endemic species of *Iris*, *Astragalus,* and other species are conserved at the Jozour Loubnan seed bank.

6- Percent of endemic fauna with conservation of their genetic diversity ensured (through in-situ and ex-situ measures)
Status of Indicator: Unknown, no available information
Notes:

- Endemic animal species in nature reserves and UNESCO man and biosphere reserves have their genetic diversity (or part thereof) conserved.
- Endemism is a marked feature of marine biodiversity in the Mediterranean, percentages are estimated between 20 and 30% of endemics. This ratio of endemism, relatively high compared to other seas and oceans, varies according to taxonomic group. It is 18% for decapodal crustaceans, 27% for hydras, 46% for sponges, 50% for ascidians, 90% for nesting sea birds (Metazoa). No conservation of their genetic diversity is ensured (www.rac-spa.org).

7- Percent of endemic flora with conservation of their genetic diversity ensured (through in-situ and ex-situ measures)
Status of Indicator: Unknown, no available information
Notes:

- Plant species in nature reserves, UNESCO man and biosphere reserves and seed banks have their genetic diversity (or part thereof) conserved.
- Seeds of endemic spp. of Iris Astrafalus, among others are conserved at Jozour Libnan seed bank.
- Endemism is a marked feature of marine biodiversity in the Mediterranean, percentages are estimated between 20 and 30% of endemics. This ratio of endemism, relatively high compared to other seas and oceans, varies according to taxonomic group. It is 40% for Rhodobionta (Plantae). No conservation of their genetic diversity is ensured (www.rac-spa.org).

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

Not applicable.

The Lebanese government needs to officially implement participatory and integrated actions to meet the NT supported by the necessary resources.

Relevant websites, web links and files

- www.moe.gov.lb
- http://www.biodiv.be/liban (Lebanon CHM)
- http://hunting.moe.gov.lb
- www.rac-spa.org
- www.faoeastmed.org

- http://www.pgrfa.org/WIEWS
- http://www.lebanon.plantgenetic.com/

NATIONAL TARGET 3

Section I - Information on the targets being pursued at the national level

National Target

Target 3: By 2030, the implementation mechanism of the Cartagena Protocol on Biosafety is operational.

Rationale

The conservation of native species in their natural habitats, and their protection from genetically engineered modifications that may affect their genetic diversity through crossbreeding will guarantee the genetic diversity of species and their potential as resources for future generations.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☒ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 2: Genetic Diversity

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 3: By 2030, the implementation mechanism of the Cartagena Protocol on Biosafety is operational.

National Actions

National Actions for National Target 3:

National Action 3.1: Enforce and make operational national legislation on biosafety through issuance of implementation mechanisms

National Action 3.2: Assess the risks related to LMOs and monitor the adequacy of equipment at certified laboratories

Measures Taken to contribute to the implementation of the NA3.1

National Action 3.1: Enforce and make operational national legislation on biosafety through issuance of implementation mechanisms

There is **one** main measure that contributes to the implementation of the NA3.1.

Measure 3.1a: National legislation on biosafety

Though in the final stages, the draft decree on "National Measures on Biosafety" has not been issued by the CoM yet. Accordingly, no implementation decisions were issued, and the implementation did not start yet.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 3 and National Priority Area 2: Genetic Diversity.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☒Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

No implementation measures taken yet, as such this measure is ineffective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Lack of approval of the Draft Decree on National Measures on Biosafety by the CoM.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of the NA3.2

National Action 3.2: Assess the risks related to LMOs and monitor the adequacy of equipment at certified laboratories

There is **one** main measure that contributes to the implementation of the NA3.2.

Measure 3.2a: Risk assessment related to LMOs

- This is not being undertaken at the Lebanese Agricultural Research Institute (LARI) as the accessions conserved in LARI's gene bank are 90% of wild provenance and 10% of wheat and barley landraces.

Contributions by academic institutions to assessing risk related to LMOs:

ISO 17025 accredited laboratory for GMOs testing at the American University of Science and Technology (AUST).

- Establishment of the laboratory in 2008.
- Acquisition of the ISO 17025 accreditation from the Hellenic accreditation system (ESYD).
    - Accreditation scope covers all stages of GMOs analysis: screening, identification and quantification.
    - Renewal of the accreditation since acquisition on yearly basis based on successful participation in international proficiency testing rounds and fulfillment of the ISO 17025 accreditation technical and management requirements.
- Material resources in the laboratory to perform GMOs analysis.
    - Availability of required equipment such as conventional PCR, real-time PCR, spectrophotometer, gel imaging system and genetic analyzer.
    - Presence of separated rooms for each stage of GMOs analysis (DNA extraction, DNA assessment, PCR setup and post-PCR analysis).
    - Application of the forward flow system to prevent any risk of contamination.
- Human resources in the laboratory to perform GMOs analysis.
    - Presence of technical and quality assurance departments.
    - All team members are adequately trained by attending training workshops since 2009 till present in collaboration with the European Commission Joint Research Centre (JRC)
- Designation of the GMOs team of scientists as biosafety experts by the United Nations Convention for Biological Diversity.
- Cooperation with the CBD under the framework of the international network of GMOs laboratories.
    - Review and update of the CBD training manual.
    - Participation in meetings organized by the CBD.
    - Participation in online forums and moderators of online discussions through the biosafety clearing house (BCH) online portal.
- Establishment of the Middle East and North Africa Network of GMOs Laboratories (MENANGL).
- Collaboration with the Norwegian Centre for biosafety "GenØk" on the BiodiverSEEDy research study: Detection of transgenes in maize landraces in Mexico
    - The study involves three GMOs laboratories from Norway, Switzerland and Lebanon. The project consists in revisiting the case of transgenes flow in Mexican

maize, as well as presenting novel research based on socio-biological analysis of contrasting communities and seed management systems. Indeed, the results show that the extent and frequency of which transgenes can be found depend significantly on the seed management and societal characteristics of the local communities.

- Development of a novel cost-effective testing strategy to face the challenge of GMOs diversity
    - The project aims at establishing an updated comprehensive matrix for the genetic characterization of genetically modified events, subsequent to an extensive revision of related databases. Furthermore, this project presents the first matrix for the regulatory approvals associated with all GM events. These matrices will facilitate the LMOs and GMOs testing process and the identification of potential GM events in the investigated sample by giving higher probability to those authorized in the countries of origin.
- Conduction of several GMOs assessment studies on a broad range of feed, food and seed samples
    - GM detection and quantification in feed consignments:
      The laboratory conducted a comprehensive GMOs analysis on soybean imported feed consignments, encompassing screening, identification and quantification of GMOs according to ISO 17025 standards. The results demonstrated that GM feed is being imported to Lebanon, with GM percentages exceeding the highest worldwide acceptable threshold.
    - GM detection in adult and infant foods:
      For a comprehensive analysis on the presence of GMOs in Lebanon, GM detection was conducted on imported and locally produced food products commercialized in the Lebanese market. These products included adult and infant foods; collected samples were representative of the whole Lebanese market. The results demonstrated the presence of GM sequences in both babies and adult food products.
      Moreover, a comparative analysis was conducted on the same infant food items commercialized in the Lebanese market and in several foreign markets where GM regulations are being applied. The results showed inconsistent GM profiles between some infant products commercialized locally compared to their foreign counterpart. The identification and quantification of GMOs in positive samples are currently in progress.
      Manuscript is in preparation for this study.
    - GM detection in agriculture seeds:
      GMOs analysis of agricultural seeds imported to Lebanon is being undertaken by Lamis Chalak (Lebanese University) and Gretta Abou-Sleymane (American University of Science and Technology), in the context of a project funded by the Lebanese University. Preliminary results show that seeds of tomatoes, eggplants, melon, watermelon, pepper and maize imported to Lebanon lack the GM sequences that were tested. Further testing is required to screen for additional GM sequences.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 3 and National Priority Area 2: Genetic Diversity.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

A laboratory for GMOs testing has been established, and extensive work towards identifying and detecting GMOs in food and agricultural seeds has been done. As such, the measure is partially effective.

Relevant websites, web links and files

- Agapito-Tenfen, S.Z., Lopez, F.R., Mallah, N., Abou-Sleymane, G., Trtikova, M., Nodari, R.O. and Wickson, F. Transgene flow in Mexican maize revisited: Socio-biological analysis across two contrasting farmer communities and seed management systems". Ecology and Evolution. 2017; 7:9461–9472.
- Mallah, N., Obeid, M., Abou-Sleymane, G. Comprehensive matrices for regulatory approvals and genetic characterization of genetically modified organisms. Food Control. 2017; 80:52-58.
- Sakr, J., Mallah, N., Chalak, L., Abou-Sleymane, G. First comprehensive GMOs testing in Lebanon: screening, identification and quantification of GM soybean imports. Food Control. 2014; 36:146-152.

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 3: By 2030, the implementation mechanism of the Cartagena Protocol on Biosafety is operational.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☐ Progress towards target but at an insufficient rate

☒ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

Though in the final stages, the draft decree on "National Measures on Biosafety" has not been approved by the CoM yet.

Indicators used in this assessment

1- Number of implemented decisions and procedures related to the Decree on "National Measures on Biosafety" issued
2- Number of applications related to the import and use of LMOs submitted
3- Number of approvals related to the import and use of LMOs issued
4- Number of trained staff in place to administer the national biosafety system
5- Number of adequately equipped and certified laboratories
6- Number of "risk assessment" conducted
7- Ratio of risk assessment summary reports as against number of decisions on LMOs
8- Number of submissions to the Biosafety Clearing House (BCH)

Other tools or means used for assessing progress

Indicators were heavily relied on in the assessment of progress towards the NTs, in the cases where the NTs had available information and data on indicators, assessment was easy and straightforward. In the absence of such information, which is the case for most NTs including NT 1, the main tool used to assess progress towards the NT consisted of desk studies of available information followed by expert discussion and review, which was eventually verified during the stakeholder meetings.

Relevant websites, web links and files

-

Level of confidence of the assessment

☒ Based on comprehensive evidence

☐ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

1- Number of implemented decisions and procedures related to the Decree on "National Measures on Biosafety" issued
Status of Indicator: 0
Notes:
- Though in the final stages, the draft decree on "National Measures on Biosafety" has not been issued by the CoM yet. Accordingly, no implementation decisions were issued, and the implementation didn't start yet.

2- Number of applications related to the import and use of LMOs submitted
Status of Indicator: 0
Notes:
- The decree has not been endorsed yet; complete banning on LMOs is currently adopted by decisions at ministerial levels.

3- Number of approvals related to the import and use of LMOs issued
Status of Indicator: 0
Notes:
- None legally approved. Importing activities are prohibited currently awaiting the endorsement of the Decree on "National Measures on Biosafety" which sets the national mechanism regulating the import and export of LMOs to and from Lebanon.

4- Number of trained staff in place to administer the national biosafety system
Status of Indicator: Unknown
Notes:
- Two training sessions were administered

5- Number of adequately equipped and certified laboratories
Status of Indicator: 1
Notes:
- AUST ISO 17025 accredited laboratory for GMOs Testing at AUST: Screening, identification and quantification.

6- Number of "risk assessment" conducted
Status of Indicator: 0
Notes:
- Since the Decree on "National Measures on Biosafety" is not endorsed and operational yet, no risk assessment for LMOs is being conducted yet for Lebanon.

7- Ratio of risk assessment summary reports as against number of decisions on LMOs
Status of Indicator: 0
Notes:
- Since the Decree on "National Measures on Biosafety" is not endorsed and operational yet, no decisions on LMOs are being taken yet for Lebanon.

8- Number of submissions to the Biosafety Clearing House (BCH)
Status of Indicator: Unknown
Notes:
- The Decree on "National Measures on Biosafety" is not endorsed and operational yet, thus no decisions on applications regarding the import of LMOs were received yet, and no decisions in this regards were taken yet for Lebanon, accordingly no submissions to the BCH were done in this regards.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☐ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

Information is available through focal points at MoE.

Relevant websites, web links and files

-

NATIONAL TARGET 4

Section I - Information on the targets being pursued at the national level

National Target

Target 4: By 2030, at least 20% of natural terrestrial and marine ecosystems are protected and all types of ecosystems are represented in the PA network.

Rationale

Efforts to maintain and sustain existing protected areas must continue while new protected areas shall be created and connected.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☒ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 3: Protected Areas.

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 4: By 2030, at least 20% of natural terrestrial and marine ecosystems are protected and all types of ecosystems are represented in the PA network.

National Actions

National Actions for National Target 4:

National Action 4.1 Develop clear and standardized criteria for characterizing natural and semi natural ecosystems found across the country

National Action 4.2 Classify identified ecosystems based on clear criteria to help guide and orient the level of emergency for intervention and the intervention approach required (conservation, restoration, sustainable land management, sustainable use of natural resources)

National Action 4.3 Produce a national map of ecosystem types and classifications to serve as a decision-making support tool and set timelines for repeating the surveys

National Action 4.4 Identify areas of high biodiversity values (such as hotspots) among the identified natural ecosystems

National Action 4.5 Include the newly identified areas of high biodiversity value in the PA network

National Action 4.6 Identify areas that could potentially become ecological corridors (such as thalwegs, sea canyons, and mountain peaks) and start preparing them (e.g. plant native trees)

National Action 4.7 Develop landscaping guidelines promoting the use of local and native species and enforce their implementation at a minimum in government funded projects and mainstream them into SEAs and EIAs

Measures Taken to contribute to the implementation of NA 4.1

National Action 4.1 Develop clear and standardized criteria for characterizing natural and semi natural ecosystems found across the country

There is **one** main measure that contributes to the implementation of the NA4.1.

Measure 4.1a: Characterizing natural and semi-natural ecosystems

- A national effort aiming at identifying and mapping major ecosystems and habitat types is ongoing. It is led by Observatoire Libano-Français de L'Environnement (O-LiFE) at the Lebanese National Council for Scientific Research (CNRS-L). Clear and standardized criteria for characterizing natural and semi-natural ecosystems found across the country are being developed in the context of this effort.
- Major coastal habitats and plant species were identified in the context of GREAT Med, a project implemented in Lebanon by the Lebanese National Council for Scientific Research (CNRS-L), the American University of Beirut (AUB) and Saint Joseph University (USJ).
- CARLIT Index methodology: The index adopted and applied by the team of the NCMS-CNRS. It allowed the collection of accurate information on the distribution and abundance of shallow-water macroalgal communities on most of the Lebanese shorelines, especially of those deserving protection (e.g. Cystoseira forests) (www.cnrs.edu.lb). This methodology allowed the characterization of habitats along the Lebanese coastline.

- Guidelines are also developed by the Shouf Biosphere Reserve:
    - Guidelines produced in the context of a project on cultural landscapes (Cultural Landscapes: Reviving the Traditional Practices of Land Use) (ENPI) ; and
    - Guidelines for restoration of stone wall of old abandoned terraces was produced in 2018 in collaboration with FAO and MoA in the context of FLRM project.

Contributions by academic institutions to characterizing natural and semi-natural ecosystems include:

- A Landscape Atlas for Lebanon is being developed (Trovato -American University of Beirut).
- Coastal and alpine habitats were identified and mapped in two important plant areas in the context of a regional project (Conserving wild plants and habitats for people across the Mediterranean) implemented by the Nature Conservation Center, American University of Beirut.
- The work done in the context of GREAT Med ENPI project allows for prioritizing conservation areas along the coast based on coastal plant diversity among other factors.
- The Society for Protection of Nature (NGO) in Lebanon implemented in close collaboration with Trovato (American University of Beirut) a project on landscape character assessment. Clear and standardized criteria were used to characterize ecosystems as part of landscapes across the country.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 4 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Criteria for identifying major ecosystems and habitats across the country are being developed. Overall, the work being undertaken at the various levels with respect to characterizing ecosystems indicates that the progress has begun, and the measure is in early implementation phase. As such, the measure is partially effective.

Relevant websites, web links and files

- http://www.greatmed.eu/
- http://www.o-life.org/
- Badreddine, A., Abboud-Abi Saab, M., Gianni, F., Ballesteros, E., Mangialajo L. First assessment of the Ecological Status in the Levant Basin: application of the CARLIT index along the Lebanese coastline. Ecological Indicators - 85 (2018): 37-47.

Other Relevant Information

The criteria for identifying major ecosystems and habitats across the country are being developed.

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

To-date, there is no national criteria for the identification and characterization of natural and semi-natural ecosystems in Lebanon, and there is a need for the development of such national criteria.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 4.2

NA 4.2: Classify identified ecosystems based on clear criteria to help guide and orient the level of emergency for intervention and the intervention approach required (conservation, restoration, sustainable land management, sustainable use of natural resources)

There are **two** measures that contribute to the implementation of the NA4.2.

Measure 4.2a: Ecosystems classification regarding terrestrial ecosystems

Several projects are being implemented throughout Lebanon to fill the need for ecosystem classifications, most notable of which are:

- SLMQ project (MoE/UNDP/GEF) is still ongoing, and the following activities are being carried out currently under the project:
    - Development of maps on land degradation over the past 10 years based on satellite imagery and identifying hotspots.
    - Performance of an ecological survey to identify species, corridors and the need for rehabilitation and reforestation, and for restoring floral species in rangeland.
- Enhancing Adaptive Capacity of the Rural Communities in Lebanon (AgriCal) Project (MoA/IFAD): The project is financed by the Adaptation Fund through IFAD and implemented by MoA and it aims to increase resilience of shepherds and small ruminants to climate change through sustainable rangeland management. The project will help prepare a community-based sustainable rangeland management plan and restore degraded rangeland areas and reduce flood risks. The project is still ongoing in which it had a first extension period for additional 17 months till April 2019, and a second extension till October 2020 had been approved recently by IFAD.
- SALMA Project (MoA/FAO): The project will tackle water resource management, rural services and infrastructure, social inclusion, and climate change. The proposed project's objective is to expand access of small farmers to supplementary irrigation as well as increase protection of agricultural lands from soil erosion in targeted remote hilly areas.
  The sectors that will benefit from this project are:
    - Crops (30% of the fund);
    - Irrigation and drainage (30% of the fund); and
    - Fishing (10% of the fund)
- Environmentally Sound and Socially Beneficial Forestation in the Shouf Biosphere Reserve Project, funded by ENPI. The project duration was from August 2014 till August 2018, however it was extended till March 31, 2019. Achievements made under this project:
    - Mapping of forestation/reforestation sites;
    - Reforestation of 25 hectares in four villages of the Shouf was executed: Maaser El Shouf, Barouk, Mristi, Aitanit (West Bekaa);
    - Forest management committees in most villages of the Shouf Biosphere Reserve; and
    - Two publications (in press) one on Forest Landscape Guidelines and another or Forest Management Guidelines
- Lebanon Reforestation Initiative (LRI) contributed towards ecosystem classification through developing:
    - Map of forest connectivity corridor that links in between reserves in the North/Mount Lebanon (i.e. Ehden and Benatael) and Bekaa (Yammoune) and reforested sites;
    - Fire combustibility map and fuel type map for Lebanon. These maps designate vulnerable land use classes to fire produced;
    - Vegetation map of Lebanon;

- Species suitability map (probability of distribution of 20 species to guide reforestation efforts);
- Maps for climate change impact on native tree species distribution in Lebanon. Study was conducted by IDAF for LRI, and it shows critical areas and adaptive management needed for a range of native species (under 2050 IPCC scenarios).

- M6- MAVA: Building the ecologic and socio-economic resilience of the Shouf Mountain Landscape by restoring and strengthening the socio-cultural fabric which sustains its biodiversity and cultural values. The project is funded by MAVA in partnership with SPNL, and is being implemented by the Shouf Biosphere Reserve from 2018 till 2020. There is ongoing monitoring of biodiversity at the Shouf Biosphere Reserve with the ultimate aim of studying the effect of traditional/cultural practices on biodiversity, in addition to an ongoing study on the effect of grazing on biodiversity in rangelands.
- STONE: Restoration and enhancement of traditional agricultural systems for the economic development and the environmental conservation of the Shouf Biosphere Reserve.The project is funded by the Italian Ministry of Foreign Affairs in partnership with Italian Oikos Institute, and is being implemented between 2018 and 2021. This project anticipates the restoration of 30 hectares of mountain terraces and traditional farming systems with positive effects on local economy, biodiversity conservation and ecosystem services.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 4 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Criteria for identifying major ecosystems and habitats across the country are being developed. Overall, the work being undertaken at the various levels with respect to characterizing ecosystems indicates that the progress has begun and the measure is in early implementation phase. As such, the measure is partially effective.

Relevant websites, web links and files

- https://knowledge.unccd.int/sites/default/files/ldn_targets/Lebanon%20LDN%20TSP%20Country%20Report.pdf

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The absence of a national list of ecosystems and habitats, and the absence of criteria for the characterization of these ecosystems and habitats hinders the achievement of this national action. Completion of NA 4.1 is crucial for this NA.

Relevant websites, web links and files

-

Measure 4.2b: Intervention regarding marine ecosystems

- CARLIT Index methodology adopted and applied by the team of the NCMS-CNRS: allowed the collection of accurate information on the distribution and abundance of shallow-water macroalgal communities on most of the Lebanese shorelines, especially of those deserving protection (e.g. Cystoseira forests) (www.cnrs.edu.lb).
- Ecological characterization through biodiversity field surveys were carried out in 2016 by the Regional Activity Centre for Specially Protected Areas (SPA/RAC) in collaboration with the Ministry of Environment in three of the proposed coastal MPAs of Lebanon: Batroun, Medfoun and Byblos within the EU-funded MedMPA Network Project executed at regional level by SPA/ RAC. The field surveys were carried out by a mixed team of national and international experts from SPA/RAC, the National Center for Marine Sciences of Lebanon-CNRSL, University of Alicante, and IUCN (www.moe.gov.lb; www.rac-spa.org).
- The NCMS-CNRS have evaluated the current status of the threatened biogenic formations of the vermetid reefs along the Lebanese coastline (www.cnrs.edu.lb).

Contribution from private initiatives:

- Mapping remaining dendropoma formations or "Vermetid Platforms" in Lebanon: A thesis study held in 2017 at the University of Balamand to assess the species biodiversity at the coastline of Berbara and to map the remaining sites of "Vemetid Platforms" in Lebanon using aerial and satellites imagery. It is considered as a baseline data for future initiatives (www.balamand.edu.lb).

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 4 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Overall, the work being undertaken at the various levels indicates that the progress has begun and the measure is in early implementation phase. As such, the measure is partially effective.

Relevant websites, web links and files

- www.moe.gov.lb
- www.rac-spa.org
- Badreddine, A., Abboud-Abi Saab, M., Gianni, F., Ballesteros, E., Mangialajo L. First assessment of the Ecological Status in the Levant Basin: application of the CARLIT index along the Lebanese coastline. Ecological Indicators - 85 (2018): 37-47.
- Mapping remaining dendropoma formations or "Vermetid Platforms" in Lebanon: A thesis study held in 2017 at the University of Balamand to assess the species biodiversity at the coastline of Berbara and to map the remaining sites of "Vemetid Platforms" in Lebanon using aerial and satellites imagery. It is considered as a baseline data for future initiatives (www.balamand.edu.lb).

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The absence of a national list of ecosystems and habitats, and the absence of criteria for the characterization of these ecosystems and habitats hinders the achievement of this national action. Completion of NA 4.1 is crucial for this NA.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 4.3

National Action 4.3: Produce a national map of ecosystem types and classifications to serve as a decision-making support tool and set timelines for repeating the surveys

There is **one** main measure that contributes to the implementation of the NA4.3

Measure 4.3a: Mapping ecosystems types

- Planned and initiated by the O-LiFE Observatory in CNRS-L
- Based on a recent bathymetrical and 2D and 3D seismic data acquired during seismic studies for oil prospection (Ghalayini et al., 2018), Lebanon was subdivided into four domains: the distal Levant Basin, the Lattakia Ridge, the Levant margin, and the onshore. The lithological characteristics of the deposited rocks and sediments within the various domains are presented on the chronostratigraphic chart along with the identified potential petroleum system components being the source, reservoir and seal (www.cnrs.edu.lb).
- CARLIT Index methodology adopted and applied by the team of the NCMS-CNRS: allowed the collection of accurate information on the distribution and abundance of shallow-water macroalgal communities on most of the Lebanese shorelines, especially of those deserving protection (e.g. Cystoseira forests) (www.cnrs.edu.lb).

Contributions by private initiatives to mapping ecosystems type:

- Maps of landscapes across Lebanon will be produced in the context of the Landscape Atlas being developed by Trovato, and the landscape character assessment project.
- The RAC/SPA, IUCN and ADR have held a marine survey in Tyre as part of the Project on "Sustainable fisheries management for improved livelihoods of the coastal fishing community in Tyre, south Lebanon". They characterized key habitats in the TCNR (between 0 and 50 meters down) and actualized and compared fish assemblage in different managed and control locations, with reference to the 2013 inventory established in the same localities.
- Mapping remaining dendropoma formations or "Vermetid Platforms" in Lebanon: A thesis study held in 2017 at the University of Balamand to assess the species biodiversity at the coastline of Berbara and to map the remaining sites of "Vemetid Platforms" in Lebanon using aerial and satellites imagery. It is considered as a baseline data for future initiatives (www.balamand.edu.lb).

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 4 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

In terms of activities carried out to produce a national map showing ecosystems types, while work is still in underway to produce a national map, it is still not yet achieved. This measure is considered partially effective.

Relevant websites, web links and files

- Ghalayini, R., Nader, F.H., Bou Daher, S., Hawie, N. and Chbat, W.E. (2018). Petroleum Systems of Lebanon: An Update and Review. Journal of Petroleum Geology, Vol. 41(2). pp 18-214
- Badreddine, A., Abboud-Abi Saab, M., Gianni, F., Ballesteros, E., Mangialajo L. First assessment of the Ecological Status in the Levant Basin: application of the CARLIT index along the Lebanese coastline. Ecological Indicators - 85 (2018): 37-47.

Other Relevant Information

- The national map of existing ecosystem types for Lebanon is being developed by CNRS-L and is anticipated in 2019.

Relevant websites, web links and files

- http://shoufcedar.org/maps/

Obstacles and Scientific and Technical Needs related to the measure taken

Initiatives for ecosystem mapping are still limited and do not cover all existing ecosystems.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 4.4

National Action 4.4: Identify areas of high biodiversity values (such as hotspots) among the identified natural ecosystems

There is **one** main measure that contributes to the implementation of the NA4.4.

Measure 4.4a: Identifying areas of high biodiversity value

- CARLIT Index methodology adopted and applied by the team of the NCMS-CNRS: allowed the collection of accurate information on the distribution and abundance of shallow-water macroalgal communities on most of the Lebanese shorelines, especially of those deserving protection (e.g. Cystoseira forests) (www.cnrs.edu.lb).
- Bathymetric survey of the Lebanese Exclusive Economic Zone (EEZ) was conducted in 2003 by the SHALIMAR bathymetric cruise (MOPWT/DGLMT, 2017).
- The MoE in Lebanon along with the IUCN, with the support of partners such as RAC/SPA suggested 14 Marine Protected Areas (MPA) and an associated program to evaluate their management

effectiveness through "Lebanon's Marine Protected Areas Strategy". The goal of this Strategy is to: 1) establish a more systematic approach to marine protected areas planning and establishment, 2) enhance collaboration for management and monitoring of MPAs, 3) increase awareness and understanding of the local community in the MPA network, 4) and finally to link Lebanon's network of MPA's to Mediterranean networks. The suggested sites are: Nakoura, Sidon Rocks, Raoucheh Cliffs and Caves, Beirut Port Outer Platform, Byblos, Medfoun Rocky Area, Batroun Phoenician Wall, Ras El Chaqaa Cliffs, Enfeh Peninsula, Litani Estuary, Awali Estuary, Damour Estuary, Nahr Ibrahim Estuary, Areeda Estuary, in addition to five sites in the deep sea (www.moe.gov.lb).

Contributions by private initiatives to identifying areas of high biodiversity value:

- Key Biodiversity Areas (KBAs) were identified at the national level based on plant diversity at the American University of Beirut in January 2017. The project was funded by MAVA Foundation through IUCN in the context of a regional project (Conserving wild plants and habitats for people across the Mediterranean) implemented by the Nature Conservation Center. Results were recently published in November 2018. There is some overlap between IPAs and KBAs, therefore the national committee for KBAs will be working on investigating the overlap between KBAs and IPAs during 2019.
- Important Plant Areas (IPAs) were identified by Kharrat et al. 2018 after initial identification by Yazbek et al. 2011.
- Key Biodiversity Areas (KBAs) were identified at the national level in the context of a project funded by the Critical Ecosystem Partnership Fund and implemented by the Society for Protection of Nature in Lebanon (SPNL) in 2016. KBAs were identified by overlaying maps of Important Plant Areas (IPAs) and Important Bird Areas (IBAs) and by consulting with national experts. Standard international criteria were used in the process.

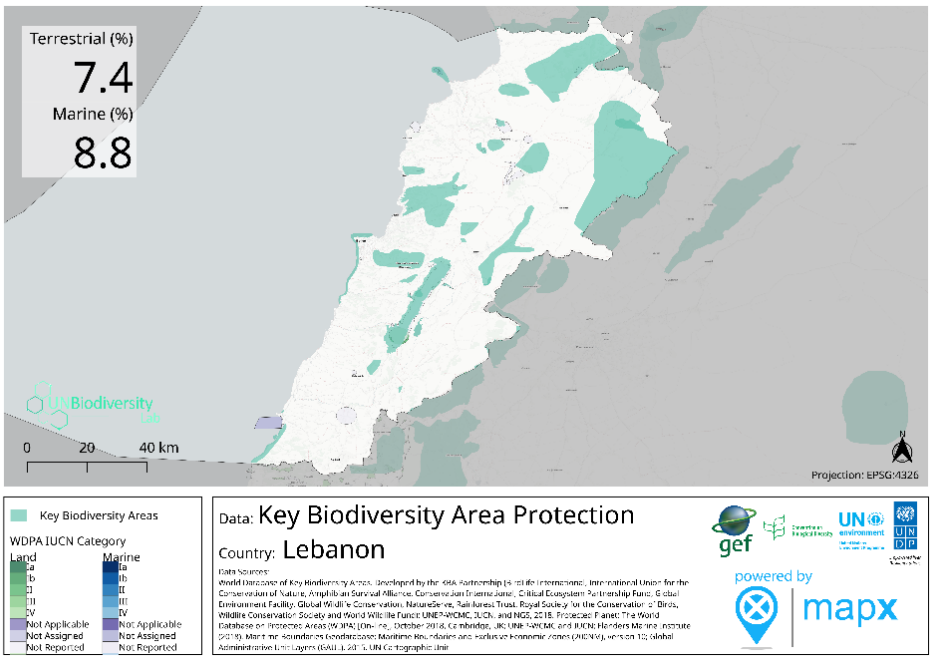


Figure 6 Key Biodiversity Areas

Source: UN Biodiversity Lab, 2018

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 4 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Not all areas of high biodiversity value are identified in Lebanon, although work is slowly progressing. This measure is partially effective.

Relevant websites, web links and files

- Badreddine, A., Abboud-Abi Saab, M., Gianni, F., Ballesteros, E., Mangialajo L. First assessment of the Ecological Status in the Levant Basin: application of the CARLIT index along the Lebanese coastline. Ecological Indicators - 85 (2018): 37-47.
- www.mopwt.gov.lb
- Bou Dagher-Kharrat M, El Zein H, Rouhan G. Setting conservation priorities for Lebanese flora—Identification of important plant areas. Journal for Nature Conservation. 2018 Jun 1;43:85-94.
- MOE, and IUCN (2012). Lebanon's Marine Protected Area Strategy: Supporting the Management of Important Marine Habitats and Species in Lebanon. Beirut, Lebanon, Gland, Switzerland Y Malaga, Spain: The Lebanese Ministry of Environment / IUCN.
- Valderrábano, M., Gil, T., Heywood, V., and de Montmollin, B. (eds.) (2018). Conserving wild plants in the south and east Mediterranean region. Gland, Switzerland and Málaga, Spain: IUCN. xiii +146 pp.

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Initiatives are still limited and do not cover all existing ecosystems.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 4.5

National Action 4.5: Include the newly identified areas of high biodiversity value in the PA network

There are **two** measures that contribute to the implementation of the NA4.5.

Measure 4.5a: New Areas included in the PA network

- The MoE in Lebanon along with the IUCN, with the support of partners such as RAC/SPA suggested 14 Marine Protected Areas (MPA) and an associated program to evaluate their management effectiveness through "Lebanon's Marine Protected Areas Strategy". The goal of this Strategy is to: 1) establish a more systematic approach to marine protected areas planning and establishment, 2) enhance collaboration for management and monitoring of MPAs, 3) increase awareness and understanding of the local community in the MPA network, 4) and finally to link Lebanon's network of MPA's to Mediterranean networks. The suggested sites are: Nakoura, Sidon Rocks, Raoucheh Cliffs and Caves, Beirut Port Outer Platform, Byblos, Medfoun Rocky Area, Batroun Phoenician Wall, Ras El

Chaqaa Cliffs, Enfeh Peninsula, Litani Estuary, Awali Estuary, Damour Estuary, Nahr Ibrahim Estuary, Areeda Estuary, in addition to five sites in the deep sea (www.moe.gov.lb).

- After an in-depth analysis of several sites around the Mediterranean, OCEANA "an international organization focused solely on oceans, dedicated to achieving measurable change by conducting specific, science-based campaigns with fixed deadlines and articulated goals" proposed 100 areas that will constitute its proposal for a network of Mediterranean MPAs, MedNet. Amongst these sites, four MPAs were proposed in deep waters within Lebanon's territorial waters further validating the importance of the East Levantine Canyon Area (ELCA): Beirut Escarpment, Saint Georges Canyon, Jounieh Canyon and Sainiq Canyon. These sites were also proposed afterwards in "Lebanon's Marine Protected Areas Strategy". Following a request for partnership sent from the Lebanese MOE, OCEANA "; carried out in 2016 a new deep-sea expedition in Lebanon, through "The Deep-Sea Lebanon" Project executed by MoE and Oceana in partnership with the Lebanese National Centre for Marine Research, SPA/RAC, and IUCN. The 2016 field expedition covered the four deep-sea sites mentioned above in addition to Chekka – Batroun canyon.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 4 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

The declaration of the MPAs is on the right track but the administrative process is taking long time. This measure is partially effective.

Relevant websites, web links and files

- MOE, and IUCN (2012). Lebanon's Marine Protected Area Strategy: Supporting the Management of Important Marine Habitats and Species in Lebanon. Beirut, Lebanon, Gland, Switzerland Y Malaga, Spain: The Lebanese Ministry of Environment / IUCN.
- www.moe.gov.lb
- www.iucn.org
- https://oceana.org/

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Newly identified areas of high biodiversity value, such as Important Bird Areas (IBAs), Important Plant Areas (IPAs) and Key Biodiversity Areas (KBAs), are not always considered in the designation of new protected areas.

The declaration of MPA is on the right track but the administrative process is taking long time.

A mechanism for recognizing areas of high biodiversity is needed at the national level so that these areas become included in the PA network.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 4.6

National Action 4.6 Identify areas that could potentially become ecological corridors (such as thalwegs, sea canyons, and mountain peaks) and start preparing them (e.g. plant native trees)
There is **one** main measure that contributes to the implementation of the NA4.6.

Measure 4.6a: Identifying ecological corridors

- Following a request for partnership sent from the Lebanese MOE, OCEANA "an international organization focused solely on oceans, dedicated to achieving measurable change by conducting specific, science-based campaigns with fixed deadlines and articulated goals"; took another deep-sea expedition, "The Deep-Sea Lebanon" Project in 2016. After an in-depth analysis of several sites around the Mediterranean, proposed 100 areas that will constitute its proposal for a network of Mediterranean MPAs, MedNet (www.moe.gov.lb). Amongst these sites, four were proposed in deep waters within Lebanon's territorial waters further validating the importance of the East Levantine Canyon Area (ELCA): Beirut Escarpment, Saint Georges, Junieh Canyon and Sainiq Canyon.
- CARLIT Index methodology adopted and applied by the team of the NCMS-CNRS: Mapped the distribution and abundance of shallow-water macroalgal communities on most of the Lebanese shorelines (www.cnrs.edu.lb).
- SLMQ Project is performing an ecological assessment to provide recommendations on the selection of suitable afforestation/reforestation sites and corridors for intervention and advise on the respective list of species to be used (trees and lower strata).
- SALMA Project is in its initial stages and has considered the identification of ecological corridors as one of its priorities (MoA/FAO).
- Effort is being undertaken by the Shouf Cedar Reserve to identify ecological corridors connecting the different cedar forests comprising the reserve. In fact, the western and eastern slopes of the Shouf Biosphere Reserve have been identified as ecological corridors and are currently undergoing preparation.

Contributions by private initiatives to identifying ecological corridors:

- Bou Dagher Kharrat (Saint Joseph University) is working on identifying ecological corridors.
- The Lebanon Reforestation Initiative (NGO) is working on identifying ecological corridors.
- Guidelines for restoration of stone wall of old abandoned terraces was produced in 2018 in collaboration with FAO and MoA in the context of FLRM project.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 4 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

In terms of activities carried out to identify area that could potentially become ecological corridors, this work is still in early stages of implementation, and is not achieved yet. This measure is considered partially effective.

Relevant websites, web links and files

- www.moe.gov.lb
- www.cnrs.edu.lb
- www.moa.gov.lb
- www.lri-lb.org
- Badreddine, A., Abboud-Abi Saab, M., Gianni, F., Ballesteros, E., Mangialajo L. First assessment of the Ecological Status in the Levant Basin: application of the CARLIT index along the Lebanese coastline. Ecological Indicators - 85 (2018): 37-47.

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 4.7

National Action 4.7 Develop landscaping guidelines promoting the use of local and native species and enforce their implementation at a minimum in government funded projects and mainstream them into SEAs and EIAs

There is **one** main measure that contributes to the implementation of the NA4.7.

Measure 4.7a: Developing landscaping guidelines

- Landscaping guidelines are routinely developed in the context of Environmental Management Plans (EMPs) of SEAs and EIAs, but they are rarely implemented or monitored.
- SLMQ Project are developing landscaping guidelines to avoid and reduce land degradation:
    - Guidelines for forest management were developed (upcoming endorsement by MoE and MoA); and
    - Guidelines for rangeland management are in process.
- Guidelines are also developed by the Shouf Biosphere Reserve:
    - Guidelines produced in the context of a project on cultural landscapes (Cultural Landscapes: Reviving the Traditional Practices of Land Use) (ENPI); and
    - Guidelines for restoration of stone wall of old abandoned terraces was produced in 2018 in collaboration with FAO and MoA in the context of FLRM project.

Contributions through private initiatives to developing landscaping guidelines:

- Landscaping guidelines are developed in the context of green certification of some projects
- Guidelines are also developed in the context of reforestation (for instance, reforestation guidelines prepared and published by the Lebanon Reforestation Initiative.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 4 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Guidelines are being routinely produced and implemented in the context of SEAs, EIAs and some projects at the Shouf Biosphere Reserve, however there is a need to further impose their implementation in all projects. This measure is partially effective.

Relevant websites, web links and files

- http://www.fao.org/lebanon/en/
- http://shoufcedar.org/
- Safi, S (2012). Vegetation Map of Lebanon, Task 1: Lebanon-specific vegetation classification system. Lebanon Reforestation Initiative.

Other Relevant Information

Some examples of projects that developed and implemented landscaping guidelines as part of the green certification:

- Lebanon Waterfront City
- Ecobkerzay
- Ahlam project.

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Lack of monitoring of the EMPs and recommendations of SEAs and EIAs to ensure proper execution and implementation.

Monitoring of EMPs proposed in EIAs is crucial

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 4: By 2030, at least 20% of natural terrestrial and marine ecosystems are protected and all types of ecosystems are represented in the PA network.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☐ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☒ Unknown

Date the assessment was done

December 2018.

Additional information

There is a national updated list on marine ecosystems based on recent field surveys, but there is no consensus yet on a national list on terrestrial ecosystems.

To-date, there is no national criteria for the identification and characterization of natural and semi-natural ecosystems in Lebanon.

Recently a national committee for KBAs has been formed and is working on consolidating the identified KBAs at the national level through the CEPF funded project implemented nationally by SPNL and KBAs for plants identified through a project implemented by the Nature Conservation Center – AUB and funded by MAVA foundation through IUCN. The committee is also assessing other potential KBAs, particularly in areas that have been under sampled in the past. While KBAs are not de facto protected, their identification will guide the designation of PAs in the future.

The Lebanese National Council for Scientific Research through O-LiFE is currently working on developing a national classification system inspired by EUNIS (European Nature Information system).

Indicators used in this assessment

1- Percent area coverage of protected natural ecosystems
2- Percent of all types of Lebanon's ecosystems represented in the PA network
3- Number of management plans for different PAs

Other tools or means used for assessing progress

Indicators were heavily relied on in the assessment of progress towards the NTs, in the cases where the NTs had available information and data on indicators, assessment was easy and straightforward. In the absence of such information main tool used to assess progress towards the NT consisted of desk studies of available information followed by expert discussion and review, which was eventually verified during the stakeholder meetings.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☐ Based on partial evidence

☒ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

Since there is there is little to no data and information on the indicators to assess progress towards NT4 whereby the assessment draws heavily on expert opinion, the level of confidence of this assessment is based on limited evidence.

1- Percent area coverage of protected natural ecosystems
Status of Indicator: Unknown, no available information
Notes:

Ca. 2.4% of the area of Lebanon is covered by nature reserves, to which we should account for additional protected forests as per law 558/1996, nature sites under the protection of MoE, Himas, and biosphere reserves.

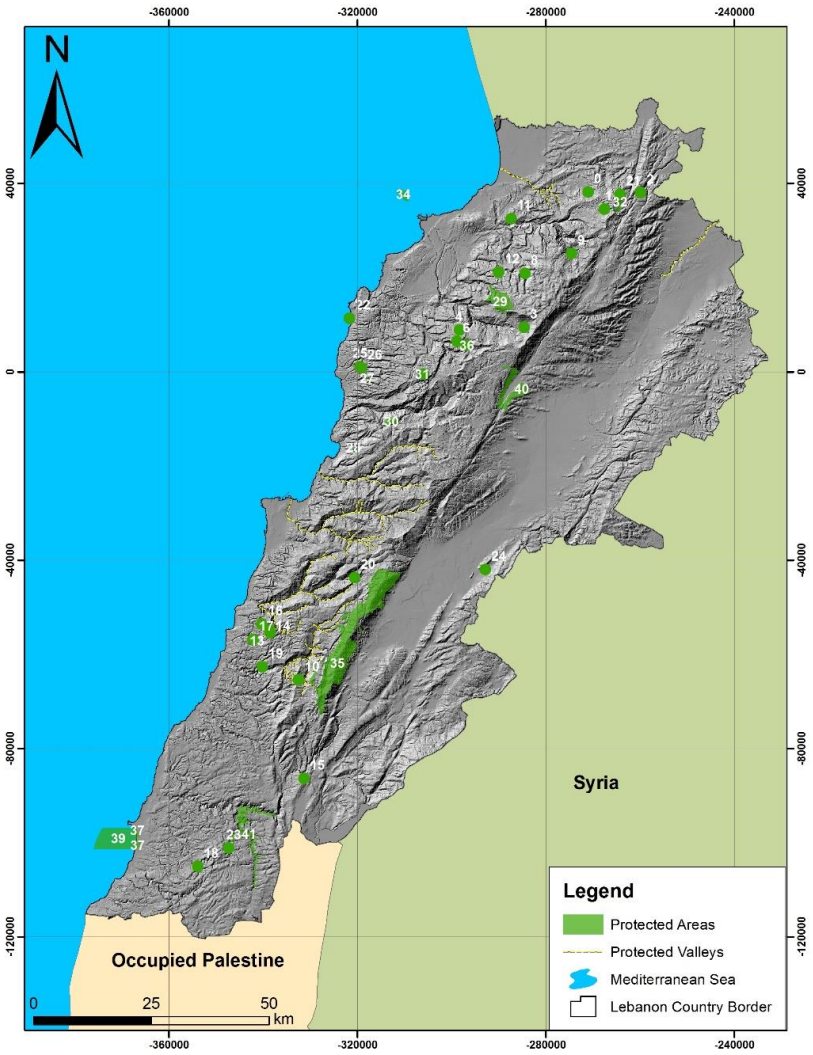


Figure 7 Some Protected Area Coverage

Source: ELARD, 2018

2- Percent of all types of Lebanon's ecosystems represented in the PA network
Status of Indicator: Unknown, no available information
Notes:
Not enough and adequate information on ecosystems is available, however information on vegetation series is available from Abi Saleh (1978) and Abi Saleh and Safi (1988).

3- Number of management plans for different PAs
Status of Indicator: 8 existing
Notes:
Management plans exist for the Shouf Biosphere Reserve and Jabal Moussa Biosphere Reserve, Tannourine, Ehden, Bentael, Tyre Coast, and Palm Islands nature reserves. In addition, management plans were developed for Ras Chekka proposed MPA and Jounieh proposed deep sea MPA.

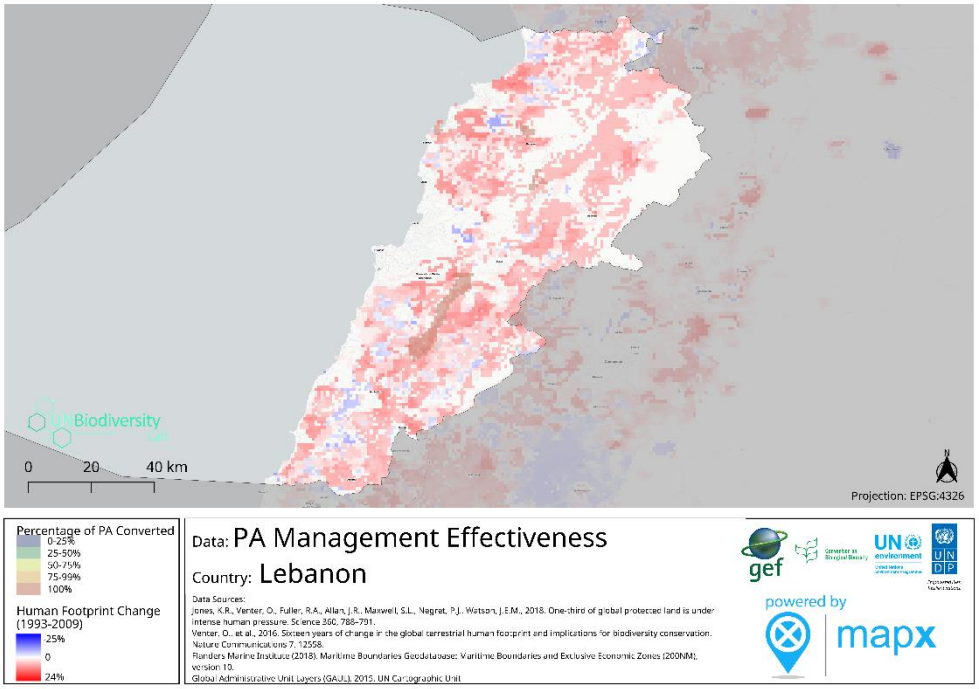


Figure 8 Protected Area Management Effectiveness

Source: UN Biodiversity Lab, 2018

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

Not Applicable.

Relevant websites, web links and files

- Abi-Saleh, B. (1978) - Etude phytosociologique, phytodynamique et écologique des peuplements sylvatiques du Liban: Signification bioclimatique et essai de cartographie dynamique. Thèse de Doctorat d'Etat ès-Sciences. Faculté des Sciences et Techniques de St Jérôme. Université d'Aix - Marseille III.
- Abi-Saleh, B. & Safi, S. (1988) - Carte de la végétation du Liban au 1/500 000 + Notice explicative. Ecologia Mediterranea, XIV (1/2): 123-142

NATIONAL TARGET 5

Section I - Information on the targets being pursued at the national level

National Target

Target 5: By 2030, the total percent coverage of nature reserves is increased to reach at least 5% of Lebanon's area

Rationale

Efforts to maintain and sustain existing protected areas must continue while new protected areas shall be created and connected.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☒ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 3: Protected Areas.

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 5: By 2030, the total percent coverage of nature reserves is increased to reach at least 5% of Lebanon's area.

National Actions

National Actions for National Target 5:

National Action 5.1 Take action to protect areas identified as "in need of protection" by the Sustainable Institutional Structure for Protected Areas Management (SISPAM) Project and other areas identified by MoE

National Action 5.2 Identify further priority areas for conservation and establish ecological inventories for these areas

National Action 5.3 Establish terrestrial nature reserves in the newly identified priority areas for conservation

National Action 5.4 Implement the Marine Protected Area Strategy and establish the proposed marine nature reserves

National Action 5.5 Endorse the revised protected areas category system, Law and related Decree

Measures Taken to contribute to the implementation of NA 5.1

National Action 5.1: Take action to protect areas identified as "in need of protection" by the Sustainable Institutional Structure for Protected Areas Management (SISPAM) Project and other areas identified by MoE

There is **one** main measure that contributes to the implementation of the NA5.1.

Measure 5.1a: Establishing protected areas

- The Decree #2878 dated 10/1/2016 declaring Ehmej Nature Site under the protection of MoE was issued based on MoE proposal, it aims to establish a microreserve to protect mainly the endemic and threatened species of Iris sofrana, based on the research studies carried out by Bou Dagher Kharrat - USJ.
- In addition, the MoE is in the process of declaring new protected areas.
    - Dinniyyeh , North Lebanon and Jabal Rihan, South Lebanon: The file is at the final stages of approval at the Parliament.
    - Ras El Chakaa, North Lebanon and Abbassiyeh, South Lebanon (Marine PAs): the file was submitted by MoE to the CoM.
    - Nmayriyyeh, South Lebanon, Andaket, North Lebanon and Rachayya el Wadi, Bekaa: The file was finalized by MoE, and will be submitted soon to the CoM.
    - Zibquine, Sarada, Rachayya el Fakhkhar and Yaroun, South Lebanon, and Ejdebrin, North Lebanon: The file is under preparation (MoE; waiting for more documents regarding land ownerships and maps).

- Qammouaa, North Lebanon: The case is awaiting the approval of the concerned municipalities. The file is in preparation.
- Jounieh deep sea MPA: the draft law and whole file was finalized by MoE, IUCN, SPA/RAC and Oceana and will be submitted to the CoM soon.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 5 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Actions were taken by MoE to declare new protected areas, as such the measure is considered as effective.

Relevant websites, web links and files

- www.moe.gov.lb
- www.IUCN.org

Other Relevant Information

- The Lebanon Mountain Trail Association developed the Lebanon Mountain Trail and are putting efforts that contribute to the rise of ecotourism sector in Lebanon. The LMT Association are also working to have a decree that recognizes the trail as a National Trail to be protected.

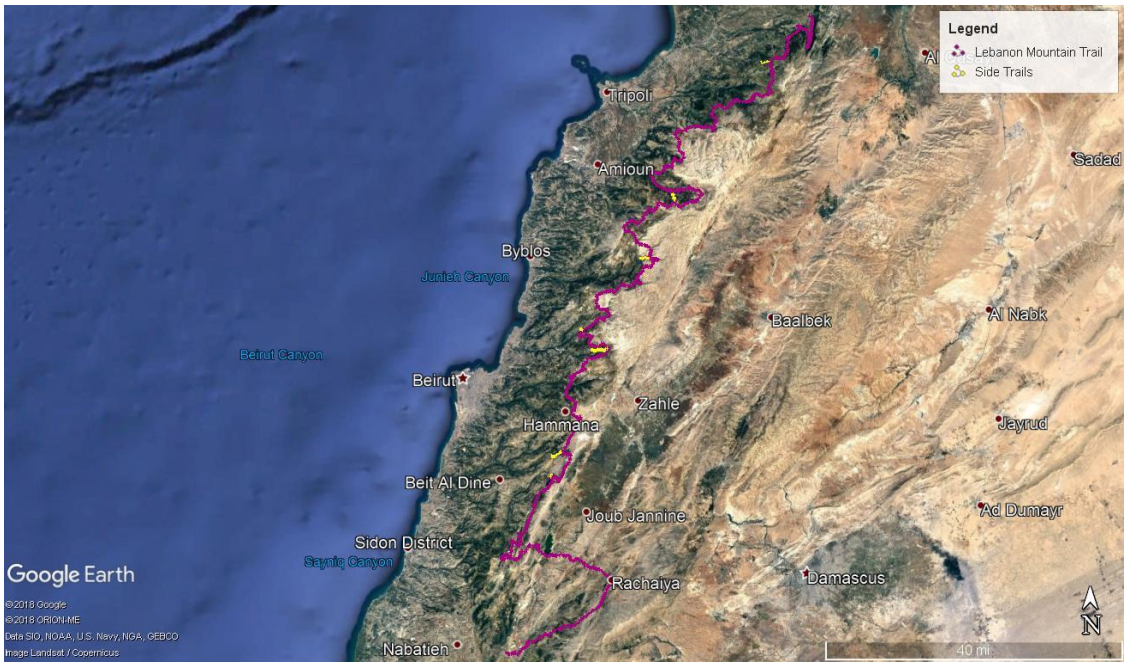


Figure 9 LMT Sections and Side Trails

Source: LMT, 2018

Relevant websites, web links and files

https://www.lebanontrail.org/#!/home

Obstacles and Scientific and Technical Needs related to the measure taken

Initiatives to declare PAs are usually based on requests from municipalities and not only on the fact that these areas have been identified as priority areas for conservation or "in need of protection". The declaration of PAs is on the right track but the administrative and legal process is taking long time due to delays in administrative processes at the CoM level (by getting the approval of other concerned ministries), and lengthy process of the endorsement of the proposed laws at the Parliament.

There are obstacles in defining land ownerships and in delineating the borders of the proposed PAs, and in some cases in getting the approval of the concerned municipalities.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 5.2

National Action 5.2 Identify further priority areas for conservation and establish ecological inventories for these areas

There is **one** main measure that contributes to the implementation of the NA 5.2.

Measure 5.2a: Identifying priority areas for conservation

- Ecological characterization through biodiversity field surveys were carried out in 2016 by the Regional Activity Centre for Specially Protected Areas (SPA/RAC) in collaboration with the Ministry of Environment in three of the proposed coastal MPAs of Lebanon: Batroun, Medfoun and Byblos within the EU-funded MedMPA Network Project executed at regional level by SPA/ RAC. The field surveys were carried out by a mixed team of national and international experts from SPA/RAC, the National Center for Marine Sciences of Lebanon-CNRSL, University of Alicante, and IUCN (www.moe.gov.lb; www.rac-spa.org).
- In 2016, the Ministry of Environment has started to implement the project, "Towards deep-sea conservation in Lebanon", in collaboration with Oceana, SPA/RAC, IUCN and the Lebanese National Centre for Marine Research, and with funds from MAVA; between 3 and 28 October 2016, experts from Oceana, SPA/RAC, IUCN and the Lebanese National Centre for Marine Research, have concluded an expedition in five deep-sea previously unstudied areas of Lebanon: Jounieh canyon, Saint Georges canyon, Beirut(Ouzai) canyon; Sayniq (Saida)canyon, and Chekka – Batroun canyon.

Contributions by academic institutions to identifying priority areas for conservation:

- Ecological inventories of some Important Plant Areas have been established by Bou Dagher Kharrat (Saint Joseph University) and the Nature Conservation Center, American University of Beirut, in the context of their research in this field.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 5 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Work towards identifying priority areas for conservation in Lebanon's marine ecosystems and establishing ecological inventories for these areas is effective, since these priority areas where identified in "Lebanon's Marine Protected Areas Strategy" issued by MoE in 2012, and ecological inventories in 14 of these proposed MPAs (9 in coastal waters and 5 in the deep sea) were carried out through field surveys executed from 2012 till 2016.

Work towards identifying further priority areas for conservation in terrestrial ecosystems and establishing ecological inventories for these areas, is still in its implementation phase and is partially effective.

Relevant websites, web links and files

- www.moe.gov.lb
- www.IUCN.org
- www.rac-spa.org
- https://oceana.org/

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 5.3

National Action 5.3 Establish terrestrial nature reserves in the newly identified priority areas for conservation

There is **one** main measure that contributes to the implementation of the NA 5.3.

Measure 5.3a: Establishing terrestrial nature reserves

- A new nature site was declared under the protection of MoE through The Decree #2878 dated 10/1/2016; Ehmej Nature Site which was classified to protect mainly the endemic and threatened species of *Iris sofrana*.
- Actions were taken by MoE to establish new terrestrial nature reserves in priority areas for conservation but the related laws were not issued yet.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 5 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Establishment of the new terrestrial nature reserves is still in the process, as such this measure is partially effective.

Relevant websites, web links and files

- www.moe.gov.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

- Complex ownership issues
- Land tenure conflict with land use
- Lengthy process for the issuance of the related laws

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 5.4

National Action 5.4 Implement the Marine Protected Area Strategy and establish the proposed marine nature reserves

There is **one** main measure that contributes to the implementation of the NA5.4.

Measure 5.4a: Activities undertaken to implement the Strategy

- Follow-up on the development in 2015 and 2018 respectively of two draft laws for the establishment of two new MPAs and their management plans: Ras El Chaqaa Cliffcoastal MPA, and Jounieh deep sea MPA. Draft law of establishment of Ras El Chaqaa MPA was submitted by MoE to the CoM, and the draft law of establishment of Jounieh MPA will be submitted to the CoM soon.

  In addition, a draft law for the establishment of an MPA in Abassieh was prepared by MoE and submitted to the CoM in 2018.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 5 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Establishment of the proposed marine nature reserves is still in the process, as such this measure is partially effective.

Relevant websites, web links and files

- www.moe.gov.lb
- www.IUCN.org

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The declaration of MPA is on the right track but the administrative and legal process is taking long time.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 5.5

National Action 5.5 Endorse the revised protected areas category system, Law and related Decree

There is **one** main measure that contributes to the implementation of the NA5.5.

Measure 5.5a: Endorsing revised PA category system

- The draft Protected Areas Framework Law which includes the revised protected areas category system is in the final stages (at the Parliament).

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 5 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Although this measure is its final stages, however it is not yet complete and as such it is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Lengthy process for the endorsement of the draft law at the Parliament.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 5: By 2030, the total percent coverage of nature reserves is increased to reach at least 5% of Lebanon's area

Progress towards the implementation of the selected target

☐ On track to exceed target

☒ On track to achieve target

☐ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

- Endorsement of the draft PA Framework Law and associated decrees are delayed.
- In general, there is a strong political interference in land use and protected areas due to conflict of interest among parties and ministries.
- Complex land ownership issues in natural areas.
- Complicated and lengthy administrative process and decision making process at the CoM and Parliament levels.

Indicators used in this assessment

1- Percent coverage of Lebanon's area by Nature Reserves

2- Number of new laws establishing new nature reserves issued

Other tools or means used for assessing progress

Available information for the indicators were heavily relied on in the assessment of progress towards this NT, in addition to desk studies of available information followed by expert discussion and review.

Relevant websites, web links and files

-

Level of confidence of the assessment

☒ Based on comprehensive evidence

☐ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

This assessment is based on comprehensive evidence since data is available and information is well-known.

1- Percent coverage of Lebanon's area by Nature Reserves

Status of Indicator: around 2.4%
Notes:

Ca. 2.4% of the surface area of Lebanon is covered by nature reserves.

- Surface of TCNR (3,889.25 Ha where Land: 176.32 Ha, Sand: 6.12 Ha, Water: 3,706.81 Ha)
- Surface of PINR (417.73 Ha / Surface of Lebanon + surface of Lebanese territorial waters)
- Surface of Horsh Ehden (1,740 Ha)
- Surface of Karm chbat (520 Ha)
- Surface of Al Shouf Cedars (15,647 Ha)
- Surface of Bentael (75.31 Ha)
- Surface of Yammouni (2,100 Ha)
- Surface of Tannourine Cedars Forest (195.48 Ha)
- Surface of Wadi Al Houjeir (3,595 Ha)
- Surface of Mashaa Chnaniir (27 Ha)
- Surface of Kafra (40 Ha)
- Surface of Ramya (20 Ha)
- Surface of Debl (25 Ha)
- Surface of Beit Leef (20 Ha)
- Surface of Jaj Cedars (20 Ha)

2- Number of new laws establishing new nature reserves issued

Status of Indicator: 0
Notes:

One nature site was declared in 2016 under the protection of MoE (Ehmej nature site), but no new nature reserves have been established since 2015. However, thirteen new nature reserves are in the process of being established by MoE:

- Regarding the terrestrial nature reserves, ten new reserves are in process of being established: Dinniyyeh, Jabal Rihan, Nmayriyyeh, Andaket, Rachayya el Wadi, Zibquine, Sarada, Rachayya el Fakhkhar, Yaroun and Ejdebrin.
- Regarding the establishment of marine reserves: two draft laws have been presented to the CoM by MoE (Ras El Chaqaa and Abassieh) and one draft law for the creation of a deep sea nature reserve at Jounieh Canyon was finalized and will be submitted to the CoM soon.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☐ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

Status of nature reserves is monitored by the MoE, Department of Ecosystems.

Relevant websites, web links and files

-

NATIONAL TARGET 6

Section I - Information on the targets being pursued at the national level

National Target

Target 6: By 2030, 50% of all natural ecosystems are sustainably managed and properly considered in spatial planning implementation.

Rationale

Given that natural ecosystems and resources in Lebanon are limited and are illegally and randomly exploited, legislation must be enforced to limit unsustainable practices.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☒ 6	☐ 11	☐ 16
☒ 2	☒ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☒ 4	☐ 9	☐ 14	☐ 19
☒ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☒ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 4: Sustainable Management and Use of Natural Ecosystems and Resources.

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 6: By 2030, 50% of all natural ecosystems are sustainably managed and properly considered in spatial planning implementation.

National Actions

National Actions for National Target 6:

National Action 6.1 Extract from Land Use and Land Cover database a map on national ecosystems highlighting those in need for sustainable management

National Action 6.2 Enforce regulations related to the management of nature reserves and increase the level of fines in relation with the nature of goods and services illegally harvested and extracted

National Action 6.3 Include non-officially classified natural ecosystems of high ecological and biodiversity value in the Master Plans of each related village

National Action 6.4 Establish a management plan for the natural areas of high ecological and biodiversity values (for those that are not classified as PAs)

National Action 6.5 Identify and map the extent and spatial distribution of area under sustainable forestry, fisheries, grazing, agriculture and water management, including information on safe ecological limits of these productive system

National Action 6.6 Organize capacity building and awareness campaigns on the value of biodiversity and the sustainable use of natural resources

Measures Taken to contribute to the implementation of NA 6.1

National Action 6.1: Develop clear and standardized criteria for characterizing natural and semi natural ecosystems found across the country

There is **one** main measure that contributes to the implementation of the NA6.1.

Measure 6.1a: Mapping ecosystems in need for sustainable management

- A national effort to develop a map of national ecosystems in need for sustainable management is ongoing. It is led by O-LiFE at CNRS-L.
- Mapping of underwater ecosystems was done in the proposed MPAs of Lebanon through the field missions undertaken from 2012 till 2016 in 9 marine coastal areas from North till South (MoE, NCMS, SPA/RAC, IUCN) and in 2016 in five deep sea areas (MoE, NCMS, Oceana, SPA/RAC, IUCN).

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 6 and National Priority Area 4.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

The map of national ecosystems and habitats that is being developed is anticipated to be completed in 2019. As such, the measure is partially effective.

Relevant websites, web links and files

www.cnrs.edu.lb

www.moe.gov.lb

Other Relevant Information

- Loss within Ecoregions documented between years 1993-2009 and levels of degradation within Ecoregions for year 2016 maps were developed using the UN Biodiversity Lab mapping tool.

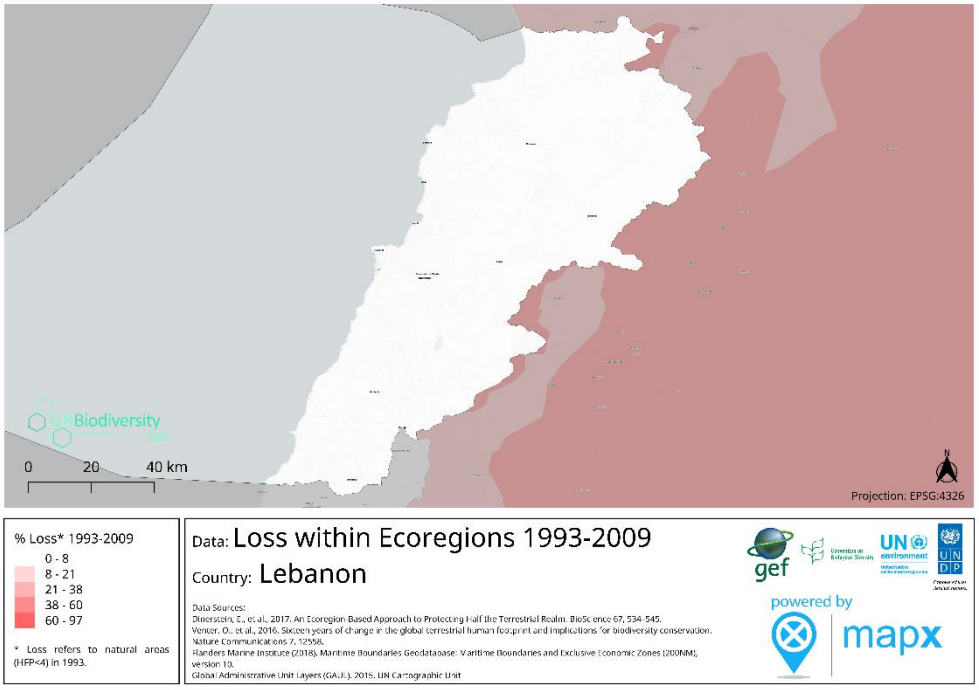


Figure 10 Loss within Ecoregions 1993-2009

Source: UN Biodiversity Lab, 2018

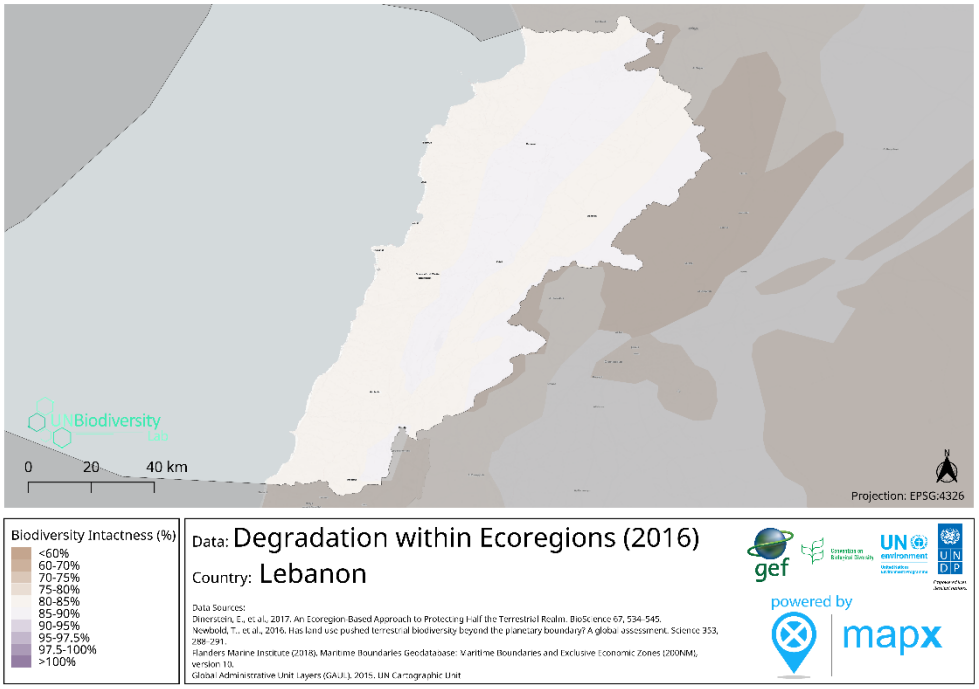


Figure 11 Degradation within Ecoregions (2016)

Source: UN Biodiversity Lab, 2018

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

In the absence of a national map of ecosystems, it would be difficult to achieve this national action.

In addition, one of the major obstacles is the high cost and the technical difficulty for mapping underwater ecosystems in the remaining areas that were not covered yet. It is important that ecosystems are identified and the national map is prepared.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 6.2

National Action 6.2 Enforce regulations related to the management of nature reserves and increase the level of fines in relation with the nature of goods and services illegally harvested and extracted

There is **one** measure that contributes to the implementation of the NA 6.2.

Measure 6.2a: Regulations enforcement

- Regulations related to the management of natural reserves are being enforced at nature reserves.
- In the context of the ongoing work undertaken by MoA to update the Forest Law, in collaboration with FAO, the level of fines within this law will be increased. Fines for illegal harvesting and extraction of forest products will be increased.

- In the new fishing law, submitted by MoA to the CoM, the level of fines for illegal fishing was increased.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 6 and National Priority Area 4.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Implementation of this measure is not the same in all nature reserves, some reserves have more resources and monitoring means to implement fines such as Shouf and Tannourin reserve. In addition, "Tyre Caza Platform for Fisheries Legislation Application" was established at Tyre as a result of the empowerment of stakeholders on marine management planning. This platform is constituted by main stakeholders with a main goal to reduce the use of destructive fishing techniques and landing of protected species, through collaborations and coordination, in order to achieve long-term sustainable fisheries management.

There is still much needed room for progress and implementation of this measure, especially for the marine environment, as such it is considered partially effective.

Relevant websites, web links and files

- www.iucn.org
- www.moa.gov.lb
- www.fao.org

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

There is an absence of resources to enforce and monitor the implementation of fines and regulations in some of the nature reserves that do not have committees and management teams. Regulations should be enforced and resources should be mobilized for that purpose.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 6.3

National Action 6.3 Include non-officially classified natural ecosystems of high ecological and biodiversity value in the Master Plans of each related village

There is **one** main measure that contributes to the implementation of the NA6.3.

Measure 6.3a: Mapping ecosystems types

- Key Biodiversity Areas classified by the Critical Ecosystem Partnership Fund (CEPF) across Lebanon.
- Vermetid platforms studied by several entities. Planned and initiated by the O-LiFE Observatory in CNRS-L

- DGUP has maps for 60% of populated areas in Lebanon.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 6 and National Priority Area 4.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Mapping ecosystem types is ongoing work in Lebanon. This measure is considered partially effective.

Relevant websites, web links and files

- www.moe.gov.lb/protectedareas/
- http://www.biodiv.be/liban (Lebanon Clearing-House)
- www.cepf.org
- www.cnrs.edu.lb DGUP – المخططات التوجيهية للمناطق
- www.transportation.gov.lb
- www.cdr.gov.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

DGUP is constantly updating and developing Master Plans, these are not scaled to the level of villages, and cover around 60% of populated areas in Lebanon. Master Plans are not developed at detailed levels.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 6.4

National Action 6.4: Establish a management plan for the natural areas of high ecological and biodiversity values (for those that are not classified as PAs)

There is **one** main measure that contributes to the implementation of the NA6.4.

Measure 6.4a: Management planning for natural areas

- Management plans are being developed for big forested areas in Lebanon in the context of the SALMA (Smart Adaptation of Forest Landscapes in Mountain Areas) initiative, Ministry of Agriculture:
    - Under Output 1.1.2: Participatory and Sustainable Forest management (PSFM) plans with a focus on pest and fire management:

Forest management plans for around 16 sites will be formulated and validated through multi-stakeholder consultations under the overall guidance of the MoA. Guidelines on how to develop the PSFM will be produced based on the priorities identified in the Forest Management Guidelines (FMG) for sustainable management of stone pine in Lebanon (2015) developed by the FAO, and adapted to the targeted forest systems. The plans, informed by the guidelines and the site specific vulnerability assessments (output 1.1.1), will be gender sensitive and will look into local knowledge and the needs of vulnerable groups.

- Under Output 1.1.4: Apply sustainable forest management practices:
  Sustainable forest management plans will look into the environmental, social and economic dimensions of the targeted project sites. The plans will prescribe the sylvicultural actions such as management of natural regeneration, transplanting, pruning, thinning to reduce fire and pest risks. Community groups will be trained on the application of the SFMP's by local forest authorities that in turn, will be trained by the project. Implementation will take place on 1000 Ha.

- Another Project Titled: Sustainable Land Management in the Qaraoun Catchment, Lebanon (MoE/UNDP/GEF), is also tackling this issue in this specific area.
  Under the objective: Sustainable land and natural resource management alleviates land degradation, maintains ecosystem services, and improves livelihoods in the Qaraoun Catchment, the project will seek the improved management of forests, the recognition of ecological corridors, and the rehabilitation and restored integrity of degraded forests, as a means of reversing land degradation trends, protect and enhance ecosystem services and improve productivity. The aim is to cover up to 10,500 ha of forests (including rehabilitation of 500 ha of degraded land) directly or through replication. More specifically, activities will include a review and updating of existing Forest Management Plans to integrate measures for rehabilitating degraded forest ecosystems.
- The MoE is leading on a Deep sea nature reserve declaration with the "Deep Sea Project" (MoE, NCMS, Oceana, SPA/RAC and IUCN), within this project, the management plan and economic valuation of Jounieh proposed deep sea MPA were prepared by SPA/RAC and IUCN.
- Management plans for RAS el Chekaa and Naqoura proposed MPAs were also prepared under the lead of MoE.

Contributions through private initiatives to management planning for natural areas:

- Management plans for natural areas of high biodiversity values are sometimes established in the context of large-scale projects such as Ecovillage and Ecobkerzay, Shouf.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 6 and National Priority Area 4.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Management plans are being developed for big forested areas and some key biodiversity marine areas, but not other natural areas. Measure is partially effective.

Relevant websites, web links and files

- www.moe.gov.lb
- http://www.fao.org/lebanon/news/detail-events/en/c/452483/
- www.iucn.org
- http:// oceana.org
- www.rac-spa.org
- https://bkerzay.com/
- https://www.thegef.org/sites/default/files/project_documents/12-01-14_Project_Document_PAD.pdf

Other Relevant Information

Marine Spatial Planning and ecosystem vulnerability by IUCN is a project that will be launched and implemented in the very near future.

Relevant websites, web links and files

- www.IUCN.org

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 6.5

National Action 6.5: Identify and map the extent and spatial distribution of area under sustainable forestry, fisheries, grazing, agriculture and water management, including information on safe ecological limits of these productive system

There is **one** main measure that contributes to the implementation of the NA6.5.

Measure 6.5a: Spatial distribution of sustainable resource management

- DGUP maps regularly updated include reserves, forests, agricultural areas, etc.
- Lebanon's National Physical Master Plan
- SPNL developed a map of the location of 22 Himas.
- It is planned to derive a grazing map in the context of the AgriCAL project (IFAD and MoA).

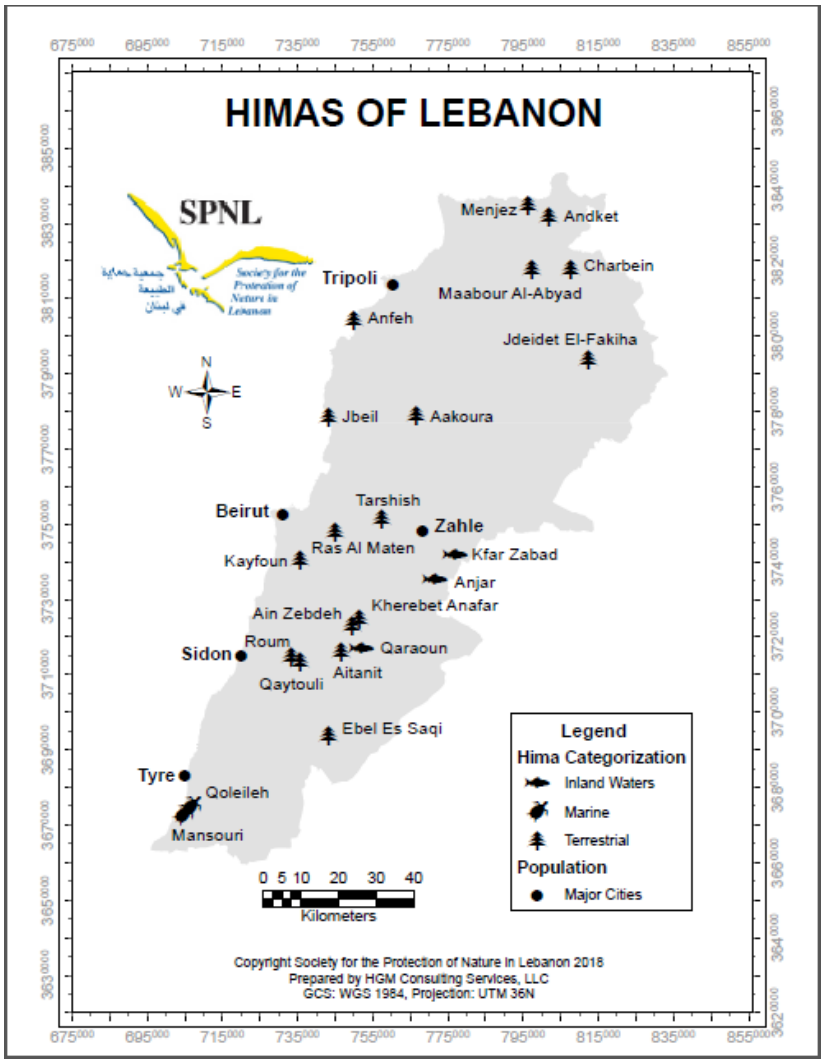


Figure 12 Himas of Lebanon

Source: SPNL, 2018

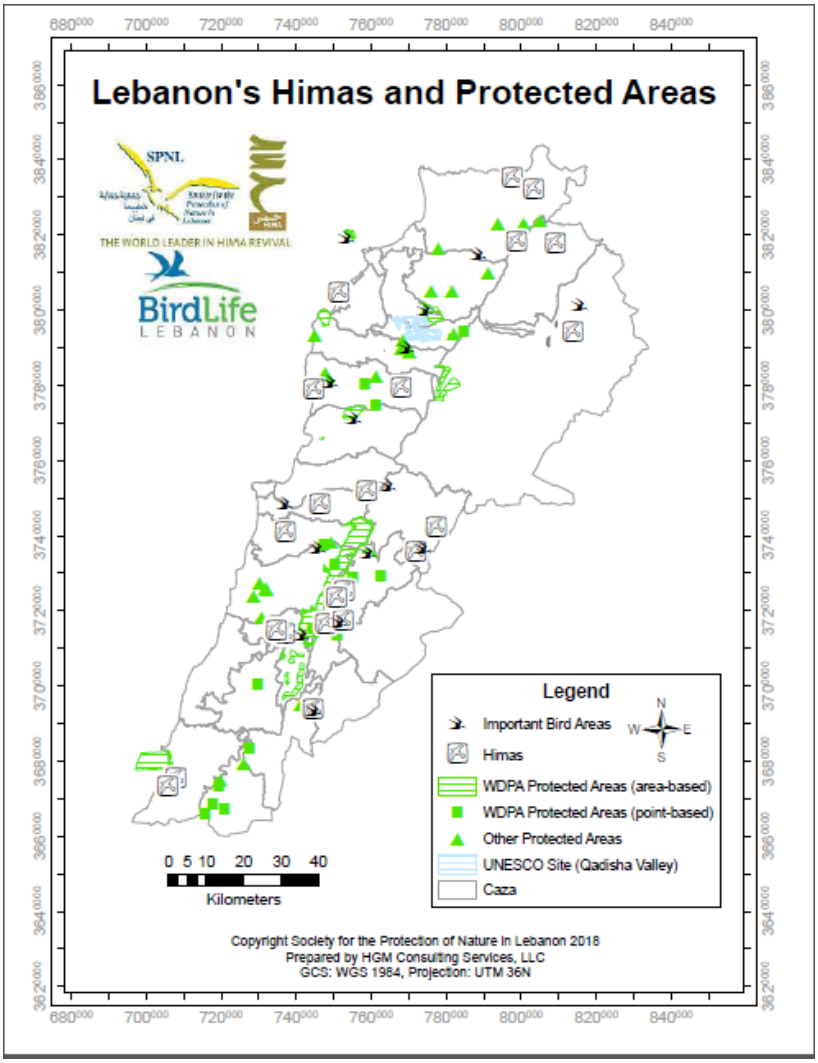


Figure 13 Lebanon's Himas and Protected Areas

Source: SPNL, 2018

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 6 and National Priority Area 4.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Maps are not fully developed. Measure is partially effective.

Relevant websites, web links and files

- www.cdr.gov.lb
- DGUP – www.transportation.gov.lb
- www.agriculture.gov.lb
- www.moe.gov.lb
- www.ifad.org

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Sustainable resource management is still inadequate in Lebanon.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 6.6

National Action 6.6 Organize capacity building and awareness campaigns on the value of biodiversity and the sustainable use of natural resources

There is **one** main measure that contributes to the implementation of the NA6.6.

Measure 6.6a: Capacity building campaigns on value of biodiversity

- MoE and UNDP have developed a training on environmental management for municipalities that have specific modules on Land Use and Ecosystem Management.
- Several local initiatives have been undertaken by universities.
- Several local initiatives have been undertaken by non-governmental organizations and nature reserves.
- Local initiatives undertaken by some nature reserves constitute an example of measures that contribute to the achievement of this national action.
- Awareness works carried out as part of SALMA project by MoA.
- The MoE, RAC/SPA, IUCN and ADR have established a platform at Tyre constituted by concerned ministries, security forces, municipalities, union of municipalities, fishermen cooperatives and syndicates, NGOs and the TCNR. Its main goal is to reduce the use of destructive fishing techniques and landing of protected species, through collaborations and coordination with local community and stakeholders, in order to achieve long-term sustainable fisheries management.
- Capacity building and awareness campaigns were organized from 2012 till 2016 by MoE to ISF and Forest Guards of MoA to enhance the enforcement of the hunting law and to stop destructive, illegal and uncontrolled hunting practices and illegal killing of wild birds and animal species. It was organized in 2012-2013 in collaboration with UNDP/GEF, in 2017 in collaboration with the EU, and in 2018 in in collaboration with EFL (NGO) with funds from GEF small grants.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 6 and National Priority Area 3.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Raising awareness on biodiversity issues is a continuous and ongoing activity especially with the endorsement of NBSAP by the Lebanese government early 2018. The implementation of this measure is still ongoing and as such is partially effective.

Relevant websites, web links and files

- www.moe.gov.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

There is a need for an awareness campaign to be developed and implemented at the national level targeting all communities to raise awareness towards biodiversity and highlighting the importance of conservation and sustainable use.

Biodiversity is not a top priority at the institutional level at the moment, national circumstances and conditions do not allow for major governmental funding on biodiversity issues. The MoE mainly relies on international projects.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 6: By 2030, 50% of all natural ecosystems are sustainably managed and properly considered in spatial planning implementation.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☒ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

There is a general deficiency in quantitative data in Lebanon, which hinders the ability to properly assess and evaluate status and trends, this is primarily due to the absence of systematic monitoring due to limited resources.

Indicators used in this assessment

1- Number of EIAs and SEAs that account for impacts on biodiversity and ecosystem services
2- Number of Management Plans issued for the natural areas of high biodiversity values (other than the sites classified as "Protected Areas")
3- Change in land use/land cover towards sustainable management over time
4- Number of times biodiversity is mentioned in national plans across all sectors
5- Number of and surface area of quarries and share of total quarries with biodiversity management/offset plans
6- Amount of funds allocated for sustainable management
7- Number of Master Plans addressing biodiversity and ecosystems
8- Percent area of all natural ecosystems under sustainable management
9- Percent of terrestrial spatial plans that include natural ecosystems
10- Percent of marine spatial plans that include natural ecosystems

Other tools or means used for assessing progress

Indicators were heavily relied on in the assessment of progress towards the NTs, in the cases where the NTs had available information and data on indicators, assessment was easy and straightforward. In the absence of quantitative information on all the indicators, progress towards the NT was also supported by expert discussion and review.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

Based on the limited data that is present for some of the indicators.

1- Number of EIAs and SEAs that account for impacts on biodiversity and ecosystem services.
Status: more than 1000 EIAs and 10 SEAs that account for the impacts on biodiversity and ecosystem services are completed and registered with the MoE.
Notes:
Most notable SEA studies include:
- SEA for Offshore Petroleum activities in Lebanese Waters (2018): the SEA for the offshore exploration and production activities has integrated NBSAP objectives and targets within its framework of objectives, targets and indicators (including those related to biodiversity protection, invasive species, etc.), and could serve as a model for future sectoral SEAs.
- SEA for the master plan of Bentael Nature Reserve: SEA for amending the zoning in the buffer zone of Bentael Nature Reserve (zone located in the immediate surroundings of the reserve, extending from its boundaries till 500 m).
- SEA for the Master Plan of Wadi Hojeir Nature Reserve and its surrounding villages.
- SEA for the Qaraoun catchment Master Plan to identify main ecological habitats, corridors, etc. and promote their preservation. A detailed ecological survey is being conducted.
- SEA for the Master Plan (SSRDP) for Akkar to preserve and protect sensitive areas and hotspots which proposed the creation of a national park in the upper mountains of Akkar. The project was not officially adopted.

2- Number of Management Plans issued for the natural areas of high biodiversity values (other than the sites classified as "Protected Areas")
Status: Unknown, no available information
Notes:
- Forest Management Plans as part of SALMA and other measures mentioned in Section II for NA 6.4
- Forest Management Plans for Andqit and Bkassine forests.

3- Change in land use/land cover towards sustainable management over time.
Status: Unknown, no available information
Notes:
- Base maps covering the entire country (before/after) available at CDR and DGU.
- Master Plans for the management of public land in Tannourine (endorsed by the DGUP in 2013), Ehden (endorsed by the DGUP in 2011), and Bentael (endorsed by the DGUP in 2013).

- CNRS/Army updates bi-annually land use land cover maps but no analysis on sustainable management was done.
- Master Plan for Shouf Biosphere Reserve was finalized and will be subject to an SEA
- Master plan for Wadi Hojeir nature reserve and its surrounding villages was finalized and currently the related SEA is under review
-

4- Number of times biodiversity is mentioned in national plans across all sectors.
Status: Unknown, no available information
Notes:
There is no way to measure this indicator.

5- Number of and surface area of quarries and share of total quarries with biodiversity management/offset plans.
Status: between 1,300 and 2,400 quarries. There are 3 quarries with management plans
Notes:
- Last official survey was done in 1986 and reports a total count of 710. Unofficial studies report 1300 and 2400.
- Most quarries in Lebanon are illegal.
- The surface area of quarries was reported to be ca. 52 million square meters by Atallah 2018.
- Three quarries have ecological rehabilitation plans (Holcim, Sibline and Sabea) and three ecological rehabilitation plans are ongoing.

6- Amount of funds allocated for sustainable management.
Status: Unknown, no available information
Notes:
- Hard to track funding since there are many acting entities especially that a large number of funding for sustainable management is provided by funding agencies like EU, USAID, FAO, GEF, MedLife and others.
- MoE should keep a national record of funding on sustainable management.

7- Number of Master Plans addressing biodiversity and ecosystems.
Status: 7
Notes:
- Master Plan for the management of public land in Tannourine, Ehden, Bentael, Wadi Hojeir, Jezzine, Upper Maten, and Shouf.

8- Percent area of all natural ecosystems under sustainable management
Status: 0.0015% of Marine and 2.4% of terrestrial.
Notes:
- These cover nature reserves but do not cover all categpries of protected areas which is unknown.
- Sustainable management is being carried out by some municipalities.
- An inventory should be developed by MoIM.

9- Percent of terrestrial spatial plans that include natural ecosystems.
Status: Unknown, no available information
Notes: It is recommended to group this indicator with indicator 7.

10- Percent of marine spatial plans that include natural ecosystems.
Status: Unknown, no available information
Notes: -

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

-

Relevant websites, web links and files

-

NATIONAL TARGET 7

Section I - Information on the targets being pursued at the national level

National Target

Target 7: By 2030, the gap between Lebanon's ecological footprint and biocapacity is alleviated to reach an equal state.

Rationale

Given that natural ecosystems and resources in Lebanon are limited and are illegally and randomly exploited, legislation must be enforced to limit unsustainable practices.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☒ 6	☐ 11	☐ 16
☒ 2	☒ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☒ 4	☐ 9	☐ 14	☐ 19
☒ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 4: Sustainable Management and Use of Natural Ecosystems and Resources.

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 7: By 2030, the gap between Lebanon's ecological footprint and biocapacity is alleviated to reach an equal state.

National Actions

National Actions for National Target 7:

National Action 7.1 Reevaluate Lebanon's biocapacity as per the Global Footprint approach (latest study was in 2011)

National Action 7.2 Assess the current ecological footprint on the identified natural ecosystems

National Action 7.3 Carry out valuations of ecosystem goods and services at the national level (payable ecosystem services)

National Action 7.4 Disseminate the results of the studies related to the economic value of biodiversity to decision makers. Provide recommendations on appropriate policy responses

Measures Taken to contribute to the implementation of NA 7.1

National Action 7.1 Reevaluate Lebanon's biocapacity as per the Global Footprint approach (latest study was in 2011)

Measure 7.1a: Reevaluation of Lebanon's biocapacity

- Shouf Valuation report: the report was published in 2015, with the objective to calculate the economic value of the Shouf Biosphere Reserve. The study also focused on carbon sequestration, fuel provision, water provision, food provision, tourism, and cultural services and patrimonial value.
- Sattout Valuation Forest: this study, published in 2007, has three main objectives, which are firstly to illustrate the differences in the value of cedar forests between citizens and villagers, users and non-users. Secondly to identify the best ways to collect local funds and design other tools (involving for example public participation) needed in setting out a sound strategy for the conservation of the cedar forests. Thirdly to use the findings of this study as a tool to investigate in further studies and to inform and influence decision makers about the importance of a long-term conservation and sustainable use program as well as to consider a strategic approach for its sustainable use.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 7 and National Priority Area 4.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

- FOA, PNUE, PAM, PlanBleu (2016). Optimiser la production de biens et services par les écosystèmes boisés méditerranéens dans un contexte de changements globaux. Fonds Français pour l'Environnement Mondial (FFEM). Retrieved from http://www.fao.org/3/a-i5887f.pdf
- Sattout, E. J., Talhouk, S. N., & Caligari, P. D. (2007). Economic value of cedar relics in Lebanon: An application of contingent valuation method for conservation. Ecological economics, 61(2-3), 315-322.
- Sarkissian, A. J., Brook, R. M., Talhouk, S. N., & Hockiey, N. (2017). Asset-building payments for ecosystem services: assessing landowner perceptions of reforestation incentives in Lebanon. Forest systems, 26(2), 1.
- Sarkissian, A. J., Brook, R. M., Talhouk, S. N., & Hockley, N. (2018). Using stakeholder preferences to select native tree species for reforestation in Lebanon. New Forests, 1-11.
- Sarkissian, A. J. (2015). Exploring payments for ecosystem services in the context of native tree planting in Lebanon (Doctoral dissertation, Prifysgol Bangor University).
- Ecodit, AVSI, IUCN, MoE (2015). The Economic Value of the Shouf Biosphere Reserve: Enhancing Sustainable Livelihood and Promoting Community Management of Shouf Biosphere Reserve. Retrieved from http://shoufcedar.org/front-page/publications-2-2/

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Lebanon's bio-capacity as per the Global Footprint approach was not reevaluated.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 7.2

National Action 7.2 Assess the current ecological footprint on the identified natural ecosystems

No measures identified.

Contribution to the Aichi Biodiversity Targets or National Targets

-

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 7.3

National Action 7.3 Carry out valuations of ecosystem goods and services at the national level (payable ecosystem services)

There is **one** main measure that contributes to the implementation of the NA7.3.

Measure 7.3a: Valuations of ecosystem goods and services

- Valuations of ecosystem goods and services of Shouf Biosphere Reserve have been carried out.
- Management plan and economic valuation were prepared by SPA/RAC and IUCN in 2018 for the proposed deep sea nature reserve in Jounieh within the context of the "Deep Sea Project" implemented by MoE, NCMS, Oceana, SPA/RAC and IUCN (www.moe.gov.lb, www.IUCN.org, oceana.org, www.rac-spa.org).
- Optimiser la production des biens et services par les écosystèmes boisés méditerranéens dans un contexte de changements globaux (FOA, PNUE, PAM, PlanBleu, 2016).
- Valuation Forest (Sattout et al., 2007): the study has three main objectives, which are firstly to illustrate the differences in the value of cedar forests between citizens and villagers, users and non-users. Secondly to identify the best ways to collect local funds and design other tools (involving for example public participation) needed in setting out a sound strategy for the conservation of the cedar forests. Thirdly to use the findings of this study as a tool to investigate in further studies and to inform and influence decision makers about the importance of a long-term conservation and sustainable use program as well as to consider a strategic approach for its sustainable use.

Contribution to the Aichi Biodiversity Targets or National Targets

Contributes to NT 7 and the National Priority Area 4.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Valuations at the national level are limited to specific ecosystems. This measure is still early stages and is partially effective.

Relevant websites, web links and files

- www.moe.gov.lb
- http://www.biodiv.be/liban (Lebanon CHM)
- www.IUCN.org
- http:// oceana.org
- www.rac-spa.org
- http://www.animaweb.org/sites/default/files/chouf_b._reserve_economic-value_edile-jan29-2015.pdf
- FOA, PNUE, PAM, PlanBleu (2016). Optimiser la production de biens et services par les écosystèmes boisés méditerranéens dans un contexte de changements globaux. Fonds Français pour l'Environnement Mondial (FFEM). Retrieved from http://www.fao.org/3/a-i5887f.pdf
- Sattout, E. J., Talhouk, S. N., & Caligari, P. D. (2007). Economic value of cedar relics in Lebanon: An application of contingent valuation method for conservation. Ecological economics, 61(2-3), 315-322.

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Valuations at the national level are still needed and initiatives are limited.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 7.4

National Action 7.4 Disseminate the results of the studies related to the economic value of biodiversity to decision makers. Provide recommendations on appropriate policy responses

There is **one** main measure that contributes to the implementation of the NA7.1.

Measure 7.4a: Dissemination of results

- Results of the study on the economic value of biodiversity conducted at Shouf Biosphere Reserve are published by MoE, IUCN and CEPF
- Sattout Valuation Forest is available at science direct and research gate websites

Contribution to the Aichi Biodiversity Targets or National Targets

This measures contribute to National Target 7.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Studies related to economic value of biodiversity are limited. Measure is in the early stages of implementation as such it is considered partially effective.

Relevant websites, web links and files

- http://www.animaweb.org/sites/default/files/chouf_b._reserve_economic-value_edile-jan29-2015.pdf
- Sattout, E. J., Talhouk, S. N., & Caligari, P. D. (2007). Economic value of cedar relics in Lebanon: An application of contingent valuation method for conservation. Ecological economics, 61(2-3), 315-322.

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 7: By 2030, the gap between Lebanon's ecological footprint and biocapacity is alleviated to reach an equal state.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☐ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☒ Unknown

Date the assessment was done

December 2018.

Additional information

There is a lack of quantitative information and data on footprint and bio-capacity.

Indicators used in this assessment

1- Change in Lebanon's footprint network
2- Number and extent of PAs
3- The gap between Lebanon's ecological footprint and biocapacity

Other tools or means used for assessing progress

With the absence of quantitative information on all the indicators, progress towards the NT was supported by expert discussion and desk review.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☐ Based on partial evidence

☒ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

1- Change in Lebanon's footprint network
Status: No information
Notes: -

2- Number and extent of PAs
Status: No information
Notes:
There are 15 nature reserves with a total surface area of ca. 81, 526 hectares, but no exact information on the area coverage of the other PAs categories.

3- The gap between Lebanon's ecological footprint and biocapacity
Status: No information
Notes: -

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

NA

Relevant websites, web links and files

-

NATIONAL TARGET 8

Section I - Information on the targets being pursued at the national level

National Target

Target 8: By 2030, the private sector has taken steps to implement plans for sustainable production and consumption to mitigate or prevent negative impacts on ecosystems from the use of natural resources.

Rationale

Given that natural ecosystems and resources in Lebanon are limited and are illegally and randomly exploited, legislation must be enforced to limit unsustainable practices. Lebanon has developed a Sustainable Production and Consumption Action Plan that if implemented, would contribute towards achieving this target. Development of incentives is usually most effective in promoting private sector support to conservation efforts.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☒ 6	☐ 11	☐ 16
☒ 2	☒ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☒ 4	☐ 9	☐ 14	☐ 19
☒ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 4: Sustainable Management and Use of Natural Ecosystems and Resources.

Relevant websites, web links and files

-

Section II. Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 8: By 2030, the private sector has taken steps to implement plans for sustainable production and consumption to mitigate or prevent negative impacts on ecosystems from the use of natural resources.

National Actions

National Actions for National Target 8:

National Action 8.1 Create incentives and establish a legislative framework for the private sector's engagement in biodiversity actions

National Action 8.2 Implement the developed incentives mechanism

National Action 8.3 Conduct awareness campaigns on the need to endorse sustainable strategies (e.g. sustainable consumption targeting consumers etc.)

Measures Taken to contribute to the implementation of the NA 8.1

National Action 8.1 Create incentives and establish a legislative framework for the private sector's engagement in biodiversity actions

There is **one** main measure that contributes to the implementation of the NA8.1.

Measure 8.1a: Incentives for private sector

- Decree 167 issued in 2017 that provides tax reductions for environmental initiatives of the private sector, including sustainable consumption and production initiatives, pollution abatement, and conservation initiatives. Application of the decree is pending the issuance of an administrative procedure via a Ministerial Decision from the Minister of Finance.
- Environmental Compliance Certificate as per Decree 8471/2012 that recognizes entities that are fully compliance with environmental standards and legislation.
- A legislative framework for the private sector's engagement in biodiversity actions has been partly established in the context of the Sustainable Production and Consumption Action Plan.
- Green banking initiatives launched by several banks such as BankMed, IBL, Banque Libano-Francais, and Audi bank.
- Green loans established by Banque du Liban, with the technical support of the Lebanese Center for Energy Conservation (LCEC), including financial incentives for: energy efficiency, renewable energy, and green buildings
- Microcredit for Tyre Coast Nature Reserve and for the fishermen in Tyre is granted by ADR NGO as part of a previous IUCN/ADR project. The project supported the fishermen with a dedicated 125,000 Euro of revolving funds dedicated for microcredit. The fund is still active even after the closure of the project for at least 3 years, till 2021 (www.IUCN.org).

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 8 and National Priority Area 4.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Incentives to promote green energy and sustainability are available and being used; however such measures are mostly effective in reducing energy consumption and air emissions, which do not have a direct linkage with biodiversity protection.

Issuance by the Council of Ministers of a decree providing tax incentives to industries and companies implementing environmental measures is a major milestone. It still requires adoption of a Decision from Minister of Finance so it can be implemented. The decree should be disseminated to all potential users along with measures that can be implemented to support biodiversity conservation.

This measure is partially effective.

Relevant websites, web links and files

- http://www.industry.gov.lb/Arabic/Arabic/MediaCenter/Documents/Full%20Report_SCP%20AP_Lebanon.pdf
- http://www.moe.gov.lb/getattachment/6f4e7989-ded5-49bf-9ff7-555ee992278d/.aspx
- http://www.lcec.org.lb/en/AboutUs

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and barriers

- Commitment of Ministry of Finance to providing incentives to private sector initiatives to protect the environment; issuance of the Decision of the Minister of Finance is a must to implement Decree 167/2017.
- Lack of wide dissemination of available financial incentives
- Lack of awareness of private sector on opportunities provided by mechanisms such as NEEREA or Decree 167/2017
- Need to strengthen communication between government and the private sector

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 8.2

National Action 8.2: Implement the developed incentives mechanism

No measure identified yet. This will become relevant as Decree 167/2017 is implemented and private sector investments linked to this mechanism and geared towards biodiversity protection are mapped.

Implementation of the Environmental Compliance Decree is on-going, and first industries should obtain their certificates by the end of 2018/early 2019.

Contribution to the Aichi Biodiversity Targets or National Targets

-

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Need a mechanism to map initiatives driven by existing incentives tools such as NEEREA, ECC and tax reductions and that target biodiversity conservation to be able to measure effectiveness.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 8.3

National Action 8.3: Conduct awareness campaigns on the need to endorse sustainable strategies (e.g. sustainable consumption targeting consumers etc.)

There is **one** main measure that contributes to the implementation of the NA8.3.

Measure 8.3a: Awareness campaigns on sustainability

- Build It Green (Lebanon's Annual Sustainability Solutions Conference): conferences are held under the supervision of MEHE. It is an annual gathering of Lebanon's environmentalists and explorers of innovative practices in the green construction.
- Several campaigns on social media
- TV programs
- Advertisements
- Guidelines have been prepared by MoE on how to use the tax incentives enabled by Decree 167/2017; these should be widely disseminated

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 8.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Awareness activities are being conducted, largely driven by the Ministry of Environment. However there are no mechanisms to measure effectiveness of such activities. Nevertheless, the measure is considered to be partially effective, given that awareness activities are actually being conducted.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Tools to measure effectiveness of awareness activities need to be developed

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 8: By 2030, the private sector has taken steps to implement plans for sustainable production and consumption to mitigate or prevent negative impacts on ecosystems from the use of natural resources.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☒ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

Incentives for the private sector are still limited.

Indicators used in this assessment

1- Number of businesses that have plans for sustainable production and consumption to mitigate or prevent negative impacts on ecosystem from the use of natural resources
2- Number of private establishments implementing sustainable production/ consumption strategies
3- Percentage of the plans that are being implemented
4- Percentage of classified establishments (for categories I, II and III) that have obtained an Environmental Compliance Certificate
5- Number of industries or businesses that have used tax incentives under Decree 167/2017 to invest in biodiversity protection initiatives
6- Number of ISO 14000 accredited establishments

Other tools or means used for assessing progress

With the absence of quantitative information on all the indicators, progress towards the NT was supported by expert discussion and desk review.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☐ Based on partial evidence

☒ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

1- Number of businesses that have plans for sustainable production and consumption to mitigate or prevent negative impacts on ecosystem from the use of natural resources.

Status: Unknown, no available information

Notes: -

2- Number of private establishments implementing sustainable production/ consumption strategies.

Status: Unknown, no available information

Notes: -

3- Percentage of the plans that are being implemented.

Status: Unknown, no available information

Notes: -

4- Percentage of classified establishments (for categories I, II and III) that have obtained an Environmental Compliance Certificate.

Status:

Notes: -

5- Number of industries or business that have used tax incentives under Decree 167/2017 to invest in biodiversity protection initiatives.

Status: Zero

Notes: application of this decree is pending signature of a Ministerial Decision from the Minister of Finance. Once done, entities will be able to benefit from tax reductions; this indicator can be obtained annually from the MoE.

6- Number of ISO 14000 accredited establishments.

Status: No information

Notes: Information not readily available. Related to the number of institutions or accreditation bodies.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

-

Relevant websites, web links and files

-

NATIONAL TARGET 9

Section I - Information on the targets being pursued at the national level

National Target

Target 9: By 2030, rehabilitation plans are implemented in at least 20% of degraded sites so that they can safeguard the sustained delivery of ecosystem services.

Rationale

Restoration of degraded and damaged ecosystems and habitats is crucial for the improvement of biodiversity conservation and livelihoods.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☒ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☒ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 5: Ecosystem Restoration.

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 9: By 2030, rehabilitation plans are implemented in at least 20% of degraded sites so that they can safeguard the sustained delivery of ecosystem services.

National Actions

National Actions for National Target 9:

National Action 9.1 Update and complete existing inventories to prepare a national inventory of degraded sites by type and location

National Action 9.2 Develop technical guidelines for the rehabilitation of the different types of degraded sites and give them a legally binding status

National Action 9.3 Develop a prioritization scheme based on socio-environmental criteria to specify sites in need of immediate intervention

National Action 9.4 Review and adapt existing rehabilitation plans to comply with the newly developed guidelines

National Action 9.5 Develop a master plan for the rehabilitation of different types of degraded sites that builds on existing master plans (i.e. quarry and dumpsite rehabilitation)

National Action 9.6 Secure funding, internally or from international donors, to enable the rehabilitation of priority sites

National Action 9.7 Undertake pilot rehabilitation in key sites based on the developed prioritization scheme covering at least one of each type: quarries, dumpsites, degraded forest, rangeland, riverbed, old terraces, and coastal areas

National Action 9.8 Designate selected degraded sites as pilot sites for research and development of effective rehabilitation methods

Measures Taken to contribute to the implementation of NA9.1

National Action 9.1: Update and complete existing inventories to prepare a national inventory of degraded sites by type and location

There is **one** main measure that contributes to the implementation of the NA9.1.

Measure 9.1a: Inventory of degraded sites

- Land degradation assessment was undertaken by MoA within the national action plan of UNCCD and land degradation neutrality. The work was coordinated by AFDC and a national report was submitted to UNCCD (2018).
- Updated Master Plan for the Control and Rehabilitation of Dumpsites throughout Lebanon was carried out in 2016 by MoE/UNDP. The Master Plan identified and mapped all dumpsites in Lebanon and assessed their situation.
- CARLIT index adopted and applied by the team of the NCMS-CNRS: Mapping sites of poor ecological status based on macroalgal species sampled and identified (www.cnrs.edu.lb).

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 9 and National Priority Area 5.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Land degradation assessment was undertaken but a national inventory of degraded sites by type and location is still needed and should be regularly updated. In other words, the measure did not achieve the intended objective of the NA and as such is considered partially effective.

Relevant websites, web links and files

- https://knowledge.unccd.int/sites/default/files/ldn_targets/Lebanon%20LDN%20TSP%20Country%20Report.pdf
- http://www.moe.gov.lb/getattachment/5df51d18-b0cb-41c1-82ba-47abfa025ce6/.aspx
- Badreddine, A., Abboud-Abi Saab, M., Gianni, F., Ballesteros, E., Mangialajo L. First assessment of the Ecological Status in the Levant Basin: application of the CARLIT index along the Lebanese coastline. Ecological Indicators - 85 (2018): 37-47.

Other Relevant Information

The Master Plan for the Rehabilitation of Dumpsites in Lebanon that was initially carried out in 2012 resulted in the rehabilitation of Saida dump in 2015-2016. The updated Master Plan carried out in 2016 focused attention on Tripoli dumpsite rehabilitation efforts, additionally, the MoE filed an official request (Letter number 470/2018 dated 29/01/2018) to the CoM to approve the initiation of rehabilitation activities in the Mount Lebanon area based on the outcomes of the study.

Relevant websites, web links and files

Not applicable.

Obstacles and Scientific and Technical Needs related to the measure taken

A national inventory of degraded sites by type and location is needed.

There is a lack for monitoring at the institutional and legal levels, most degraded sites in Lebanon are illegal, fines and legal actions are rarely followed-up.

The national inventory of degraded sites by type and location should be developed, these sites should be continuously monitored, and rehabilitation measures should be implemented as much as possible.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 9.2

National Action 9.2: Develop technical guidelines for the rehabilitation of the different types of degraded sites and give them a legally binding status

There is **one** main measure that contributes to the implementation of the NA9.2.

Measure 9.2a: Developing technical guidelines for rehabilitation of degraded sites

- A technical booklet that provides guidelines for the rehabilitation of quarries is being prepared by Khater et al (O-LiFE, Lebanese National Council for Scientific Research).
- Guidelines for the restoration of degraded lands in Zahleh/ Rachaya/ West Bekaa region will be developed in the context of the SLMQ project, implemented by the MoE and UNDP.
- Guidelines for the restoration of rangelands and forests will be developed in the context of the SALMA initiative implemented by MoA and FAO.
- Guidelines for dumpsite rehabilitation prepared in 2016 as part of the Updated Master Plan for the Rehabilitation of Dumpsites by MoE-UNDP.
- Guidelines for forest and landscape restoration in Shouf Biosphere Reserve is being developed by Shouf Biosphere Reserve in the context of the Forest and Landscape Restoration initiative (FLRI) which is funded by EU through the ARD program of the Ministry of Agriculture.
- Guidelines elaborated by the HOLCIM Liban cement company and IUCN entitled "Mediterranean Quarry Rehabilitation Manual: Learning from the Holcim experience (2014)".
- Under the project entitled "Promoting marine biodiversity and improving fishery potential and marine ecotourism activities through the deployment of Artificial Reefs off the Lebanese coast" implemented by the MCR-IOE-UOB (2018-2020) under the activity of PROMARE Project which is implemented by EU in partnership with MoE, one of the project outputs is the development of a "Replicability Guidelines and Methodological Approaches for ARs in Lebanon" that can be adopted for the restorations of underwater marine environments that are under pressure or degraded (www.balamand.edu.lb).

On the other hand, contributions from private initiatives and academic institutions include:

- Technical guidelines have been developed for the rehabilitation of specific degraded sites:
    - Quarries belonging to Holcim Liban (CNRS-L in partnership with HOLCIM Lafarge company).
    - Three quarries (Mdoukha, Aita el Fakhkhar and Maqne) in the Bekaa (CNRS-L in collaboration with USAID/LRI).
- CNRS-L is preparing with AUF, University of Avignon (France) and University of Mohammad V (Morocco) a booklet on technical approaches for rehabilitation of quarries. The MOE in Lebanon is contributing to this booklet.

Contribution to the Aichi Biodiversity Targets or National Targets

These measures contribute to National Target 9 and National Priority Area 5.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is a stepping stone for land degradation rehabilitation works, although rehabilitation initiatives are still limited, this measure could be considered as an early implementation phase for future potential rehabilitation works. This measure is partially effective.

Relevant websites, web links and files

- http://www.moe.gov.lb/getattachment/5df51d18-b0cb-41c1-82ba-47abfa025ce6/.aspx
- CNRS-I/AFDC/IUCN/Holcim. 2014. Mediterranean Quarry Rehabilitation Manual: Learn the Holcim Experience.
- http://bit.ly/FLRguidelines

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Technical guidelines are being developed; however, they are not given a legally binding status.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 9.3

National Action 9.3: Develop a prioritization scheme based on socio-environmental criteria to specify sites in need of immediate intervention

There is **one** main measure that contributes to the implementation of the NA9.3.

Measure 9.3a: Prioritization Scheme and criteria for rehabilitation intervention

- A chapter in the technical booklet for the rehabilitation of quarries that is being developed by Khater et al (O-LiFE, Lebanese National Council for Scientific Research) will tackle criteria to specify quarry sites in need of immediate intervention.
- The updated Master Plan for Dumpsites rehabilitation (MoE-UNDP) prioritized dumpsites based on socio-environmental criteria and recommended rehabilitation options.

Contribution from private initiatives:

- Within the context of GREAT Med, a prioritization scheme for specifying coastal sites in need of immediate intervention was developed.
- El Hajj (unpublished) developed a decision support system that enables prioritization of areas to be protected and conserved based on existing and projected threats.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 9 and National Priority Area 5.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Although this measure is contributing to specific sites' rehabilitation, it is very specific. This measure is partially effective.

Relevant websites, web links and files

- http://www.moe.gov.lb/getattachment/5df51d18-b0cb-41c1-82ba-47abfa025ce6/.aspx
- http://www.greatmed.eu/

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

A prioritization scheme for rehabilitation of contaminated sites does not exist nation-wide and is not monitored or managed at the institutional level. It is mainly focused on specific studies that are updated irregularly and are not always endorsed at the governmental level.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 9.4

National Action 9.4: Review and adapt existing rehabilitation plans to comply with the newly developed guidelines

No identified measures that could contribute to this NA.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 9 and National Priority Area 5.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 9.5

National Action 9.5 Develop a master plan for the rehabilitation of different types of degraded sites that builds on existing master plans (i.e. quarry and dumpsite rehabilitation)
There is **one** main measure that contributes to the implementation of the NA9.5.

Measure 9.5a: Master plan for rehabilitation

- National management guidelines for forest and rangeland restoration will be developed in the context of the SLMQ project (MoE/UNDP/GEF).
- Restoration efforts, aiming at restoring terraces, pastoral lands, croplands, orchards, are being undertaken at the Shouf Biosphere Reserve (Funded by MAVA foundation and implemented by the reserve, ACS, and SPNL). In addition, similar initiative is being implemented at Qannoubine valley, North Lebanon.
- Rehabilitation of dumpsites based on the Updated Master Plan for the Closure and Rehabilitation of Uncontrolled Dumpsites throughout the Country of Lebanon with assigned costing and rehabilitation options.

At the private level:

- Rehabilitation plans have been developed for several quarries: Mdoukha, Aita el Fakhkhar, Maqne, Holcim Liban, Cementerie Nationale, etc.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 9 and National Priority Area 5.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure contributed to the development of master plans, however, this needs to be carried out and endorsed at the institutional national level. As such, this measure is considered partially effective.

Relevant websites, web links and files

- http://www.moe.gov.lb/getattachment/5df51d18-b0cb-41c1-82ba-47abfa025ce6/.aspx

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

National management guidelines for forest and rangeland restoration are being developed; moreover, restoration efforts undertaken at the Shouf Biosphere Reserve are being replicated in other areas. A master plan for the rehabilitation of different types of degraded sites is still needed.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 9.6

National Action 9.6: Secure funding, internally or from international donors, to enable the rehabilitation of priority sites

There is **one** main measure that contributes to the implementation of the NA9.6.

Measure 9.6a: Funding for rehabilitation of priority sites

- MAVA foundation, the International Union for the Conservation of Nature, USAID and AUF, among others support rehabilitation activities in Lebanon.
- Saida dumpsite rehabilitation was implemented by UNDP in collaboration with MoE and funded by the Government of Lebanon.
- Some municipalities funded and implemented by their own means basic rehabilitation for existing dumpsites (covering or relocating) within their jurisdiction.
- Tripoli dumpsite rehabilitation design is already carried out, funding for its rehabilitation is being followed.
- Hazzerta dumpsite rehabilitation plan and implementation will commence in few months, the project is being managed and implemented by UNDP based on the Kingdom of The Netherlands funding.
- Part of the quarry of Holcim Liban being rehabilitated, funded Holcim Liban.
- Reforestation in degraded forest sites in Lebanon done by MoA, SALMA project (MoA/FAO), LRI, Jouzour Loubnab, AFDC, etc.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 9 and National Priority Area 5.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Priority rehabilitation of all sites have not been identified at the national level. Existing studies are more specific and focus on one type of sites. Some of the funding acquired are specific to geographical areas or targeted communities and do not always follow priority sites. For example, Hazzerta dumpsite scored 504 in the Updated Master Plan and is a not a priority dumpsite for rehabilitation.

This measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The Lebanese National Council for Scientific Research funds projects that involve rehabilitation; however, the funds are not dedicated only for rehabilitation. Priority rehabilitation sites have not been identified at the national level.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 9.7

National Action 9.7: Undertake pilot rehabilitation in key sites based on the developed prioritization scheme covering at least one of each type: quarries, dumpsites, degraded forest, rangeland, riverbed, old terraces, and coastal areas

There is **one** main measure that contributes to the implementation of the NA9.7.

Measure 9.7a: Rehabilitation activities implemented

- Terraces were restored at the Shouf Nature Reserve and Qannoubine and quarries are being restored at Aita el Fakhkhar, Mdoukha and Maqne, though the choice of sites is not based on a developed prioritization scheme.
- Saida Dumpsite: The seafilling of the marine coastal environment by the Saida chaotic dumpsite creating land space as real estate (www.lb.undp.org).
- Rehabilitation of degraded forest sites in Lebanon through reforestation is being done by MoA, SALMA project (MoA/FAO), LRI, Jouzour Loubnab, AFDC and initiatives from other NGOs.

Contributions by NGOs to undertaking pilot rehabilitation:

- Quarries are being restored at Aita el Fakhkhar, Mdoukha and Maqne, though the choice of sites is not based on a developed prioritization scheme.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 9 and National Priority Area 5.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

There is still much more work to be done in terms of rehabilitation activities on degrades sites, what has been so far is only a stepping stone or a sign of early implementation of such initiatives. This measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

Three projects involving terrace/quarry rehabilitation have been implemented at the Shouf Biosphere Reserve since 2015:

- Mediterranean Mosaics: Strengthening the Resilience of Mediterrameam Landsacapes of socio-economic and climate change. The project is funded by MAVA, and the first phase of the project was executed between 2012 and 2015 and aimed to design a pilot landscape restoration plan. The implementation started during the second phase of the projects, which runs between 2015 and 2019 (www.mediterraneanmosaics.org).

- M6: Building the ecologic and socio-economic resilience of the Shouf Mountain Landscape by restoring and strengthening the socio-cultural fabric which sustains its biodiversity and cultural values. The project is funded by MAVA in partnership with SPNL and is being implemented by the Shouf Biosphere Reserve from 2018 till 2020.
- STONE: Restoration and enhancement of traditional agricultural systems for the economic development and the environmental conservation of the Shouf Biosphere Reserve.The project is funded by the Italian Ministry of Foreign Affairs in partnership with Italian Oikos Institute and is being implemented between 2018 and 2021.

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The national prioritization scheme has not been developed yet, which hinders the achievement of this national action.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 9.8

National Action 9.8 Designate selected degraded sites as pilot sites for research and development of effective rehabilitation methods

There is **one** main measure that contributes to the implementation of the NA9.8.

Measure 9.8a: Degraded sites selected as pilot sites for research and development

- The CNRS targeted the largest artificial lake in Lebanon, Lake Qaraoun in Bekaa valley, for being highly polluted. A specific treatment methodology is applied based on machines emitting ultrasounds on regular intervals during the day. This technique kills the cyanobacteria without releasing their toxins into the water and therefore limiting their population in the lake.

Contributions by NGOs to designating pilot sites for rehabilitation:

- Three quarries at Maqne, Mdoukha and Aita el Fakhar will be restored by LRI and will be designated as pilot sites for research and development of effective rehabilitation models for quarries.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 9 and National Priority Area 5.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

www.cnrs.edu.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

A new rehabilitation technique tested in Qaraoun Lake has been recently adopted and results will be obtained in the near future. Nevertheless, it is not a holistic solution as the land sources of pollution are still flowing into the Litani river and therefore into the Qaraoun Lake.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 9: By 2030, rehabilitation plans are implemented in at least 20% of degraded sites so that they can safeguard the sustained delivery of ecosystem services.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☒ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

There is a general deficiency in quantitative data in Lebanon, which hinders the ability to properly assess and evaluate status and trends, this is primarily due to the absence of systematic monitoring due to limited resources.

Indicators used in this assessment

1- Amount of funds allocated for rehabilitation plans
2- Percent of degraded sites with implemented rehabilitation plans
3- Total number of sites requiring rehabilitation

Other tools or means used for assessing progress

Progress towards the NT was based on collected data on indicators and was supported by expert discussion and desk review.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and

- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

Quantitative data does not exist for the indicators.

1- Amount of funds allocated for rehabilitation plans.

Status: Unknown, no available information

Notes:

- Around 2 million USD have been allocated for rehabilitation plans at the Shouf Biosphere Reserve.
- Around 20 million dollars have been allocated by the Lebanon Reforestation Initiative for rehabilitation plans.
- Around 150 thousand USD have been allocated by MADA for rehabilitation of quarries.
- Dumpsites rehabilitation such as Saida, Tripoli, etc.
- Several initiatives on private and public levels are trying to meet the 40 M trees replanatation target set by the GoL.
- 3 rehabilitation plans are implemented for quarries and 3 are ongoing
- Funding by the Lebanese government for the rehabilitation of dumpsites in Mount Lebanon. CoM approved the fund in February 2017, however the actual funds transfer decree never issued.

2- Percent of degraded sites with implemented rehabilitation plans.

Status: Unknown, no available information

Notes:

- There are 40 degraded sites with implemented rehabilitation plans at the Shouf Biosphere Reserve.
- There are also 64 forest sites with rehabilitation plans implemented by the Lebanon Reforestation Initiative (The number amounts to 69, with a total area of ca. 1100 hectares, if quarry sites are added.). Rehabilitation work sarted in November 2018.
- Saida dumpsite
- 3 rehabilitation plans are implemented for quarries and 3 are ongoing

3- Total number of sites requiring rehabilitation.

Status: Unknown, no available information

Notes:

There is no national estimate for the total number of degraded sites requiring rehabilitation since not all contaminated or degraded land are identified. Identified sites are:

- More than 900 dumpsites identified in the Master Plan.
- Abandoned legal and illegal quarries
- Abandoned industrial sites
- Eroded sites due to illegal clearing of its vegetative cover
- Twenty sites, with a total area of ca. 150 hectares require rehabilitation within the Shouf Biosphere Reserve.
- Total number of quarries 2400 (-3 already rehabilitated)

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☐ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

MoE monitors number of legal quarries by issuing permits and carrying out surveys, MoE keeps track of reported dumpsites and through the master plan.

Relevant websites, web links and files

-

NATIONAL TARGET 10

Section I - Information on the targets being pursued at the national level

National Target

Target 10: By 2030, the national Law on access and benefit sharing is endorsed, operational and enforced.

Rationale

Access to Lebanon's biological and genetic resources must be regulated and fair and equitable sharing of benefits from their utilization must be ensured.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☒ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 6: Access and Benefit Sharing.

Relevant websites, web links and files

-

Section II. Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 10: By 2030, the national Law on access and benefit sharing is endorsed, operational and enforced.

National Actions

National Actions for National Target 10:

National Action 10.1 Finalization of the MoE draft Law on Access to Lebanese biological and genetic resources and sharing of the benefits arising from their utilization (in relation to Nagoya Protocol) in harmony with the MoA draft Law on the Management of Lebanese Plant Genetic Resources in relation to the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

National Action 10.2 Development of implementation Decrees for each Law

National Action 10.3 Development of legal monitoring and compliance procedures with defined roles and responsibilities

Measures Taken to contribute to the implementation of the NA 10.1

National Action 10.1 Finalization of the MoE draft Law on Access to Lebanese biological and genetic resources and sharing of the benefits arising from their utilization (in relation to Nagoya Protocol) in harmony with the MoA draft Law on the Management of Lebanese Plant Genetic Resources in relation to the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

There is **one** main measure that contributes to the implementation of the NA10.1.

Measure 10.1a: Progress of draft law on access and benefit sharing

- The Government of Lebanon ratified the Nagoya Protocol through Law number 3 dated Feb. 3, 2017.
- The draft national Law on Access to Lebanese biological and genetic resources and sharing of the benefits arising from their utilization was submitted to the Council of Ministers and is currently under review.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 10 and National Priority Area 6.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

The Draft law was finalized and completed and is currently in its final stages for the anticipated approval, as such this measure was effective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The draft law is still under review by the Council of Ministers. Sometimes the administrative process at the Council of Ministers takes long time due to more urgent national matters, and due to the consultation process with all concerned ministries and public institutions.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 10.2

National Action 10.2: Development of implementation Decrees for each Law

No measures identified yet. Implementation Decrees for each law will be developed after the national laws are endorsed.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 10 and National Priority Area 6.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The draft law is still under review by the Council of Ministers.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 10.3

National Action 10.3 Development of legal monitoring and compliance procedures with defined roles and responsibilities

No measures identified yet. Legal monitoring and compliance procedures will be developed after the national laws are endorsed.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 10 and National Priority Area 6.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

The draft law is still under review by the Council of Ministers.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 10: By 2030, the national Law on access and benefit sharing is endorsed, operational and enforced.

Progress towards the implementation of the selected target

☐ On track to exceed target

☒ On track to achieve target

☐ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

The draft law is still under review by the Council of Ministers. Sometimes the administrative process at the Council of Ministers takes long time due to more urgent national matters, and due to the consultation process with all concerned ministries and public institutions.

Indicators used in this assessment

1- National Law on access and benefit sharing of biological and genetic resources is adopted
2- Number of applications for ABS submitted
3- Number of prior informed consent (PIC) issued by Lebanon related to ABS
4- Number of signed ABS agreements for exchange of biological resources
5- Number of infringements

Other tools or means used for assessing progress

-

Relevant websites, web links and files

-

Level of confidence of the assessment

☒ Based on comprehensive evidence

☐ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on

- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

The Draft National Law is being reviewed by the Council of Ministers.

1- National Law on access and benefit sharing of biological and genetic resources is adopted
Status: 1

2- Number of applications for ABS submitted
Status: Not Applicable since the law is not approved yet or implemented yet

3- Number of prior informed consent (PIC) issued by Lebanon related to ABS
Status: Not Applicable since the law is not approved yet or implemented yet

4- Number of signed ABS agreements for exchange of biological resources
Status: Not Applicable since the law is not approved yet or implemented yet

5- Number of infringements
Status: Not Applicable since the law is not approved yet or implemented yet

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☐ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

Monitoring will be needed by Ministry of Environment, Ministry of Agriculture and Ministry of Economy.

Relevant websites, web links and files

-

NATIONAL TARGET 11

Section I - Information on the targets being pursued at the national level

National Target

Target 11: By 2030, effective measures are in place to control the introduction and diffusion of Invasive Alien Species (IAS) into the environment.

Rationale

IAS represent a real threat, especially to archeological sites and marine ecosystems. Immediate actions need to be implemented.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☒ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 7: Invasive Alien Species.

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 11: By 2030, effective measures are in place to control the introduction and diffusion of Invasive Alien Species (IAS) into the environment.

National Actions

National Actions for National Target 11:

National Action 11.1 Support ongoing efforts for the establishment of a register of IAS reported in the Mediterranean basin. This register should be considered a live document to be updated when new IAS are identified

National Action 11.2 Identify and map pathways of introduction/proliferation of IAS in Lebanon to allow for better management and monitoring

National Action 11.3 Regulate the import of species for agricultural, landscape, recreational, and reforestation purposes to avoid genetic pollution of local species and genotypes

National Action 11.4 Develop and implement an awareness strategy for the management of identified IAS

Measures Taken to contribute to the implementation of NA 11.1

National Action 11.1: Support ongoing efforts for the establishment of a register of IAS reported in the Mediterranean basin. This register should be considered a live document to be updated when new IAS are identified.

There is **one** main measure that contributes to the implementation of the NA11.1.

Measure 11.1a: Ongoing efforts related to IAS

Activities that contribute to this measure are done by both public and private initiatives:

- Within the "Integrated Monitoring and Assessment programme (IMAP)" executed at regional level by the Regional Activity Centre for Specially Protected Areas SPA/RAC, a national monitoring programme for marine biodiversity in Lebanon was prepared in 2017 by SPA/RAC in close collaboration with the Ministry of Environment and it included a national monitoring programme for marine non-indigenous species (NIS) (Bitar, CNRS), among other key marine species (www.moe.gov.lb; http://www.biodiv.be/liban; www.rac-spa.org).
- A National Action Plan on marine species introductions and invasive species in Lebanon was developed in 2018 by SPA/RAC in collaboration with MoE (Bariche, AUB), (www.moe.gov.lb; http://www.biodiv.be/liban; www.rac-spa.org).
- Invasive Alien Species factsheets: Factsheets for the most significant marine invasive alien species in Lebanon, and a protocol for invasive alien species monitoring in the marine environment of Lebanon were developed in December 2018, through a joint project executed by the Ministry of Environment, IUCN, UN Environment with GEF funds (Bariche, AUB). (www.IUCN.org).
- Bariche et al. (2015) used DNA barcoding to study Red Sea fishes in the Mediterranean Sea, the first study on marine biological invasion using DNA barcoding in Lebanon.

- Bariche and Azzurro (2016) assessed the utility of internet-based social media (Facebook in particular) as a tool for early detection of marine invaders.
- Samaha et al. (2016) identified traits associated with the introduction of Red Sea fish species into the Mediterranean, and studied temporal changes in patterns of introduction.
- Bariche, in collaboration with international experts, studied the identity and origin of the invasive common lionfish and assessed its range expansion in Mediterranean waters (Bariche et al. 2017; Azzurro et al. 2017). Azzurro and Bariche (2017) also evaluated local knowledge and awareness on lionfish in the Eastern Mediterranean.
- A list of invasive alien plant species of Lebanon is being compiled by Karam (Lebanese University), Noun (Lebanese University), Hage (Notre Dame University), Yazbek (International Center for Agricultural Research in Dry Areas) and Al-Zein (American University of Beirut).
- A list of invasive alien insects is being compiled by Nemr (Holy Spirit University Kaslik). Emphasis is being placed on species of economic importance in the Levant (Tuta absoluta (Tomato leafminer), Leptoglossus occidentalis (Western Conifer Seed Bug), some species of fruit flies etc.).
- FAO-EastMed report "The lessepsian migration and its impact on Eastern Mediterranean fishery" (2010): A network of experts on IAS species was established, which had the responsibility to promote the issue of IAS species in the Mediterranean. A database was developed listing the IAS species caught by fishing gears in the Mediterranean Sea and indicative data on the species expansion and capture by fisheries in different geographic divisions of the East Mediterranean (www.faoeastmed.org)
- The MCR-IOE-UOB assessed in 2016 the stocks of three selected commercial species: Boops boops (Bogue) showing fishing pressure on the species; the Diplodus sargus sargus (White Sea Bream) revealing that fishing pressure is on the limits; and the IAS crab Portunnus pelagicus (Blue crab) showing also fishing pressure on its stocks. In addition the biological parameters of the IAS Lagocephalus sceleratus (Silver Cheeked Toadfish) where studied earlier (2012) showing that the species spawns from May to August and the length at first maturity is reached at 40cm.
- Records of non-indigenous species are being recorded along the Lebanese coast by different institutions working on marine environment in Lebanon.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 11 and National Priority Area 7.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

The ongoing work for this measure is crucial in the identification of IAS in Lebanon's territory and waters and would contribute to a national register on IAS.

New national initiatives are undertaken to create this register from existing and ongoing field surveys and data compilation from existing work. MoE and CNRS will be the main reference regarding this topic.

Relevant websites, web links and files

- www.moe.gov.lb
- http://www.biodiv.be/liban
- www.cnrs.edu.lb
- www.rac-spa.org
- www.IUCN.org
- www.faoeastmed.org
- Bariche, M., Torres, M., Smith, C., Sayar, N., Azzurro, E., Baker, R., and Bernardi, G. 2015. Red Sea fishes in the Mediterranean Sea: a preliminary investigation of a biological invasion using DNA barcoding; Volume 42, Issue 12
- Azzurro, E., Castriota, L., Falautano, M., Bariche, M., Broglio, E., and Andaloro, F. 2016. New records of the silver-cheeked toadfish Lagocephalus sceleratus (Gmelin, 1789) in the Tyrrhenian and Ionian Seas: early detection and participatory monitoring in practice; Volume 5, Issue 4
- Samaha, C., zu Dohna, H., and Bariche, M. 2016. Analysis of Red Sea fish species' introductions into the Mediterranean reveals shifts in introduction patterns; Volume 43, Issue 9
- Azzurro, E., Stancanelli, B., Di Martino, V., and Bariche, M. 2017. Range expansion of the common lionfish Pterois miles (Bennett, 1828) in the Mediterranean Sea: an unwanted new guest for Italian waters; Volume 6, Issue 2
- Azzurro, E., and Bariche, M. 2017. Local knowledge and awareness on the incipient lionfish invasion in the eastern Mediterranean Sea; Volume 68, Issue 10

Other Relevant Information

Invasive alien species, particularly pests and disease vectors, will be identified in the context of the SALMA initiative (Anticipated December 2020).

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Lack of resources at the institutional level to encourage the creation of an inventory on IAS that is regularly updated in coordination with local universities, NGOs and organizations that are regularly researching IAS.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 11.2

National Action 11.2: Identify and map pathways of introduction/proliferation of IAS in Lebanon to allow for better management and monitoring

There is **one** main measure that contributes to the implementation of the NA11.2.

Measure 11.2a: Ongoing activities related to the Identification and mapping of pathways of introduction/proliferation of IAS in Lebanon

Activities that contribute to this measure are done by both public and private initiatives:

- With the contribution of the MOA, FAO-EastMed report "The lessepsian migration and its impact on Eastern Mediterranean fishery" (2010): A network of experts on IAS species was

established, which had the responsibility to promote the issue of IAS species in the Mediterranean. Scientists highlighted the importance of monitoring environmental parameters in all the East Mediterranean including Lebanon to better understand the migration mechanisms and pathways of IAS species (www.faoeastmed.org).

- Regional studies on Non-Indigineous Species (NIS) showed that two thirds of the 751 multicellular NIS introduced into the Mediterranean Sea are considered Erythraean NIS (ENIS)—species introduced through the Suez Canal (Galil et al., 2017). Most of these species are recorded in the Levant Sea and therefore Lebanon (www.IUCN.org).
- Invasive Alien Species factsheets: Factsheets for the most significant marine invasive alien species in Lebanon, and protocols for invasive alien species monitoring in the marine environment of Lebanon were developed in December 2018, through a joint project executed by the Ministry of Environment, IUCN, UN Environment with GEF funds. The factsheet related to each species includes –among others- information about the introduction and pathways of this species (www.IUCN.org).

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 11 and National Priority Area 7.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Activities under this measure are limited to the marine environment, no noticeable measures were identified for the terrestrial environment.

Relevant websites, web links and files

- www.moe.gov.lb
- www.agriculture.gov.lb
- www.cnrs.edu.lb
- www.rac-spa.org
- www.IUCN.org
- Galil, B., Marchini, A., Occhipinti-Ambrogi, A., and Ojaveer, H. 2017. The enlargement of the Suez Canal – Erythraean introductions and management challenges. Management of Biological Invasions; Volume 8, Issue 2: 141–152

Other Relevant Information

Identifying and mapping pathways of introduction and proliferation of invasive alien terrestrial species has been highlighted as a priority at O-LiFE, however no work has been undertaken yet in this direction.

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 11.3

National Action 11.3 Regulate the import of species for agricultural, landscape, recreational, and reforestation purposes to avoid genetic pollution of local species and genotypes

Measure 11.3 a: Importation of species regulation

- The MOA elaborated several decisions to regulate such import under strict conditions.
- Recommendations of measures on marine IAS prevention and control are being developed through a joint project executed by the Ministry of Environment, IUCN, UN Environment with GEF funds.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 11 and National Priority Area 7.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

The ongoing work for this measure is crucial in the regulation of import activities, however, this measure is not yet fully reach its intended objective.

Relevant websites, web links and files

- www.moe.gov.lb
- www.IUCN.org

Other Relevant Information

A ministerial decision was issued by MOA prohibiting the import and introduction of all cedar seeds and plants (Decision 108/1, 12/9/1995) with the ultimate aim of avoiding genetic pollution of the endemic *Cedrus libani*. However, cedars are native and not IAS.

Lebanon is one of the countries who have ratified the "Ballast Water Management Convention, 2004" but Lebanon has no legal framework for building ports and their infrastructure, and no regulation for ballast water treatment.

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

- Regulations that control the import of species for agricultural, landscape, recreational and reforestation purposes are existing but not fully implemented.
- In particular, there are no specific regulations that control the import of potentially invasive ornamental species.

- Political instability in the country is slowing down and hampering enforcement of related agreements.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 11.4

National Action 11.4: Develop and implement an awareness strategy for the management of identified IAS

There is **one** main measure that contributes to the implementation of the NA11.4.

Measure 11.4a: Awareness strategy

The MOE, IUCN and GEF have held in October and November 2018 workshops on marine IAS for decision makers and the wider public. In addition, within the same initiative, a brochure for public awareness on IAS in the marine environment is being developed (www.moe.gov.lb).

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 11 and National Priority Area 7.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is building the foundation for raising awareness, the work is still in early implementation and progress, and more work should be done in the future.

This measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 11: By 2030, effective measures are in place to control the introduction and diffusion of Invasive Alien Species (IAS) into the environment.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☐ Progress towards target but at an insufficient rate

☒ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018. .

Additional information

Ongoing work is limited to the identified certain species. It is not clear how this work is contributing to the control and diffusion of IAS in the Lebanese environment especially that a national inventory on IAS does not even exist.

Indicators used in this assessment

1- Number of revised policies and laws and legal texts issued that cover IAS
2- Number of measures in place to control the introduction and diffusion of IAS into the environment
3- Trends in number of invasive species
4- Number of trainings and capacity building seminars related to IAS
5- Number of awareness, press, events, media releases, Google trends in Lebanon, related to the topic.

Other tools or means used for assessing progress

Data on indicators, desk review and expert discussions assessed this progress.

Relevant websites, web links and files

-

Level of confidence of the assessment

☒ Based on comprehensive evidence

☐ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

Data on indicators exist.

1- Number of revised policies and laws and legal texts issued that cover IAS.

Status: 1 legislation available

Notes:

- The MoA issued a decree in July 2011 (Decree 676/1) which bans fishing, selling and consuming of the IAS *Lagocephalus sceleratus*.
- Through a joint project executed by the Ministry of Environment, IUCN, UN Environment with GEF funds, measures on IAS prevention and control in the marine environment will be recommended for adoption by different relevant authorities, and responsibilities of each authority will be specified to ensure the adoption of an effective national IAS Policy.

2- Number of measures in place to control the introduction and diffusion of IAS into the environment.

Status: 1 measure in place

Notes:

- Lebanon is one of the countries who have ratified the "Ballast Water Management Convention, 2004" but Lebanon has no legal framework for building ports and their infrastructure, and no regulation for ballast water treatment (ERML, 2012;www.Balamand.edu.lb, www.moe.gov.lb).
- Through a joint project executed by the Ministry of Environment, IUCN, UN Environment with GEF funds, measures on IAS prevention and control in the marine environment will be recommended for adoption by different relevant authorities, and responsibilities of each authority will be specified to ensure the adoption of an effective national IAS Policy.

3- Trends in number of invasive species.

Status: Increasing a lot due to Suez canal and climate change where many species are migrating from red sea to mediterranean

Notes:

- Invasive species are a regional issue therefore their trends is not limited to national borders. Regional studies on Non-Indigenous Species (NIS) showed that two thirds of the 751 multicellular NIS introduced into the Mediterranean Sea are considered Erythraean NIS (ENIS)—species introduced through the Suez Canal (Galil et al., 2017).

- FAO-EastMed project in his technical document "The lessepsian migration and its impact on Eastern Mediterranean fishery" in 2010, recorded 62 alien species caught by fishing gears in Lebanon. While the actual total of all marine invasive species is much higher when summing invasives belonging to all the species groups. The number is increasing everyday with the widening of the Suez Canal, the ballast waters of ships and climate change.

4- Number of trainings and capacity building seminars related to IAS.

Status: 2

Notes:

- The MOE, IUCN and GEF have held in October and November 2018 two workshops on IAS for decision makers and the wider public (www.moe.gov.lb).

5- Number of awareness, press, events, media releases, Google trends in Lebanon, related to the topic.

Status: Unknown, no available information. There is a suggestion to drop or modify this indicator to only include institutional awareness campaign. There are not means to measure this indicator as broad as it is.

Notes:

- Marine Invasive Alien Species factsheets were developed but not published yet. The Factsheets once disseminated are considered an important awareness tool.
- A brochure for public awareness on IAS in the marine environment is being developed.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☐ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

A National Monitoring Plan for marine biodiversity including IAS was developed by SPA/RAC and MoE in 2017 but is not implemented yet.

Relevant websites, web links and files

- www.moe.gov.lb
- www.rac-spa.org
- www.IUCN.org

NATIONAL TARGET 12

Section I - Information on the targets being pursued at the national level

National Target

Target 12: By 2030, 100% of school and university students and at least 60% of the public are aware of the importance of biodiversity, its values, and the need for its conservation and sustainable use.

Rationale

Given that threats to biodiversity mostly result from people's lack of awareness and knowledge. Awareness on the importance of biodiversity and ecosystems and their influence on people's well-being will influence people to develop a sense of responsibility.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☒ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 8: Communication, Education and Public Awareness.

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 12: By 2030, 100% of school and university students and at least 60% of the public are aware of the importance of biodiversity, its values, and the need for its conservation and sustainable use.

National Actions

National Actions for National Target 12:

National Action 12.1 Raise the awareness of decision makers on the importance of biodiversity and its conservation, sustainable management, and promoting related education (Deputies, Ministers, Directors Generals, Heads of Departments and Heads of Services)

National Action 12.2 Enhance the role of the awareness unit at the MoE to improve dissemination and public outreach through social media and direct public outreach (e.g. biodiversity related tips through SMS, a monthly or yearly scientific journal distributed to schools, universities, public institutions, etc.)

National Action 12.3 Build on the Central Administration of Statistics (CAS) services to assess and monitor people's awareness on biodiversity

National Action 12.4 Further adopt and implement the existing National Strategy for Environmental Education developed by AFDC and adopted by the MoEHE. Implementation should be coupled with training and capacity building of school teachers.

National Action 12.5 Organize participatory events to raise students and public' awareness about biodiversity, i.e. national science fair, guided open-house events at the MoE

Measures Taken to contribute to the implementation of NA 12.1

National Action 12.1: Raise the awareness of decision makers on the importance of biodiversity and its conservation, sustainable management, and promoting related education (Deputies, Ministers, Directors Generals, Heads of Departments and Heads of Services)

There is **one** main measure that contributes to the implementation of the NA12.1.

Measure 12.1a: Awareness raising on value of biodiversity

- In 2017, MoE organized within the STREG Project (funded by EU), a training on the hunting law's enforcement in the different governorates in Lebanon targeting the ISF and forest guards of the Ministry of Agriculture. At the end of the training sessions for ISF , and just prior to the opening of the hunting season, a final workshop was organized in Beirut in 14 September 2017, in presence of high level representatives from the Directorate General of ISF and the MoA, where presentations were given about the provisions of the hunting law and the need of its proper enforcement, the event included submission of certificates to the ISF and forest guards that have completed the training, the certificates were delivered to each one of them by their superiors and by MoE, and EU representatives.
- In 2018, MoE organized in collaboration with the NGO "Environment for Life" and with funds from the GEF Small Grant Programme, another training on the hunting law's enforcement targeting the ISF. Before starting the training in the different governorates, a workshop was held in Beirut, targeting the leaders and decision makers in the different concerned institutions

due to their influencing role in the enforcement of the hunting law and its regulations in Lebanon. The workshop aimed to stress on the importance of the regulation of hunting practices and the prevention of illegal and random hunting, in addition to enhancing the cooperation between the concerned public administrations to improve the control of hunting practices in order to halt the violations.

This workshop was attended by two deputies in the Lebanese parliament, who are also members of the Parliamentary Environment Committee; a high level representative from the Ministry of Defense; and three high level representatives from the Ministry of Interior and Municipalities/General Directorate of Internal Security Forces: Commander of Mount Lebanon, the Head of Public Relations Division, and the Director of Service and Operations Division, and from the Ministry of Agriculture: the head of Forestry and Natural Resources Service.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 12 and National Priority Area 8.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is building the foundation for raising awareness for decision-making purposes, however, the work is still in early implementation and in progress, and more work should be done in the future. This measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

The digital manual developed by MoT targets school directors and teachers; however, no effort at raising the awareness of other decision makers has been undertaken.

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 12.2

National Action 12.2: Enhance the role of the awareness unit at the MoE to improve dissemination and public outreach through social media and direct public outreach (e.g. biodiversity related tips through SMS, a monthly or yearly scientific journal distributed to schools, universities, public institutions, etc.)

Measure 12.2a: Disseminating tips on Biodiversity value

No measures identified at the MoE level for this NA.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 12 and National Priority Area 8.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

Funded by the Diane Foundation, the Nature Conservation Center at the American University of Beirut is developing Daskara, a mobile phone application and website that are partly intended to engage the public in the conservation of culture and nature. Once launched, Daskara will be a map-based application that communicates and publicizes biodiversity-related tips. For example, Important Bird Areas (IBAs) will be presented to the public as potential bird watching areas. Users of this application will know when they are in the vicinity of such areas and will learn what best practices to follow (such that the ecology of the area is not compromised).

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Lack of resources and differences in priorities in the MoE is delaying this NA.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 12.3

National Action 12.3: Build on the Central Administration of Statistics (CAS) services to assess and monitor people's awareness on biodiversity

No measures identified for this NA.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 12 and National Priority Area 8.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Lack of needed funding and resources at CAS.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 12.4

National Action 12.4: Further adopt and implement the existing National Strategy for Environmental Education developed by AFDC and adopted by the MEHE. Implementation should be coupled with training and capacity building of school teachers.

There is **one** main measure that contributes to the implementation of the NA12.4.

Measure 12.4a: Adopting the National Strategy for Environmental Education

- Following the adoption of the National Strategy by the MEHE, AFDC in collaboration with MEHE developed the environmental education curriculum for grades 1-6 (first and second cycle of basic education) together with guidebooks and handouts for teachers. AFDC is also actively involved in training school teachers, as well as trainers from the MEHE and the Center for Educational Research and Development (CRDP) affiliated with the Ministry, on the implementation of the National Strategy. (AFDC submits progress reports to MEHE but these are not published.)

Contributions by academic institutions to environmental education:

- In private schools, environmental education depends on the curriculum adopted and the school's policy rather than the National Strategy.
- In private schools and some public schools, environmental education is usually multidisciplinary, where material on the environment is covered in biology, chemistry, civic education, geography and the languages. Some teachers undertake initiatives to conduct extracurricular activities pertaining to the environment, and/or to establish environment clubs.
- Moreover, extracurricular activities and tools to involve students and spread awareness among students on matters related to biodiversity are also being done through the Health, Education and Environment at DOPs in GDE at MEHE. Several programs exist including 2 main training of trainers programs: one on forests where 110-120 health and environment educators

in public schools were trained by the program since 2014. And recently, the MEHE in collaboration with MoE and IFAW has implemented another program related to birds, in 2017-2018 the program trained 110 health and environment educators in public schools on birds', the hunting law, etc. and included the preparation of an educational guidebook on the importance of birds and the need for their conservation that was disseminated to the educators to be used by them for training the students.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 12 and National Priority Area 8.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is actively under implementation, and as such it is partially effective as it has not fully reached its objectives. Two more cycles still need to be met as part of the National Strategy by the MEHE.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

There is a lack in funding and resources by MEHE that is prohibiting the implementation of the strategy in all Lebanese areas. AFDC carries out some training and capacity building by their own funding.

It is recommended that CERD should start implementing training and capacity building for all educators as part of the implementation strategy.

Awareness programs and trainings targeting schools should be done through a centralized platform that is supervised and managed by MEHE. It is recommended that NGOs active in biodiversity issues coordinate with MEHE to avoid duplication of work and reach proper outreach.

Relevant websites, web links and files

- https://www.crdp.org/?la=en

Measures Taken to contribute to the implementation of NA 12.5

National Action 12.5: Organize participatory events to raise students and public' awareness about biodiversity, i.e. national science fair, guided open-house events at the MoE

There is **one** main measure that contributes to the implementation of the NA12.4.

Measure 12.5a: Participatory events to raise students' and public awareness about biodiversity:

- The MoE allocated funds for the creation of an underwater diving trail at the Palm Island Nature Reserve (PINR) for the promotion of ecotourism at PINR while documenting richness

and biodiversity in the area and presenting it for the public in an informative and scientific way.

- The Ministry of Tourism developed a digital manual and documentary targeting school directors and teachers. The manual provides information about activities and attractions available in rural villages, with the aim of helping organize school trips. Many activities in this manual pertain to biodiversity (visiting nature reserves for example).

- The Ministry of Education is revising the Lebanese curriculum to include biodiversity issues, this is being done by CERD.

- Moreover, extracurricular activities and tools to involve students and spread awareness among students on matters related to biodiversity are also being done through the Health, Education and Environment at DOPs in GDE at MEHE. Several programs exist including 2 main training of trainers programs: one on forests where 110-120 health and environment educators in public schools were trained by the program since 2014. And recently, the MEHE in collaboration with MoE and IFAW has implemented another program related to birds, in 2017-2018 the program trained 110 health and environment educators in public schools on birds', the hunting law, etc. and included the preparation of an educational guidebook on the importance of birds and the need for their conservation that was disseminated to the educators to be used by them for training the students.

- WASH guidebook, which tackles Water Sanitation and Hygiene for School children, was distributed by MEHE to health educators at 27 public schools in 2017/2018.

- A new program was developed by MEHE in 2018 in collaboration with GreenHand organization who own a tour bus that educates on species on Plants. This bus tours schools for educational and awareness purposes. This service is provided for free for public schools.

- Several awareness campaigns are organized by the nature reserves teams for students and the general public in the nature reserves.

Contributions by academic institution to conducting participatory events to raise students' and public awareness:

- International Biodiversity Day at the American University of Beirut (IBDAA) organized annually by the Nature Conservation Center at the American University of Beirut; in the context of celebrating the International Biodiversity Day (22 May), the Nature Conservation Center at the American University of Beirut has been hosting an academic poster forum called IBDAA that allows for interdisciplinary discourse between undergraduate and graduate university students and experts in the field. Over the past 10 years, IBDAA hosted more than 2,000 university students with different backgrounds and majors.

- Annual event is organized by the Lebanese Association for Advancement of Science (LAAS) where Lebanese scientists and students profit from this platform to present studies and share expertise and create partnerships. In 2018 the event was organized at the main campus of the University of Balamand hosting more than 100 scientific presentations.

Contributions by NGOs*:*

- Diaries of the Ocean NGO is actively engaged in marine biodiversity awareness in Lebanon, some of their activities include:

- Activities run on World Ocean Day: 300 students from private schools from different age groups attended the activities which included an educational tour about climate change, fish anatomy, fishing devices, marine biology, and a beach clean-up activity. Afterwards, the students did some art work from the collected waste.
- School education campaigns targeting some school and students from all group ages to raise awareness on different environmental and biodiversity topics that include: climate change, marine biodiversity, pollution, fish anatomy, fishing devices/ techniques, etc. (2017-ongoing).
- Talks and awareness sessions with general public members in certain public places in Beirut and to environmental sciences students at University of Balamand.
- Involvement of a community service and learning program at the International College (IC) in Beirut on the fisheries sector, as part of the program students will develop a booklet on sustainable fishing.
- Conducted underwater biodiversity awareness tours in collaboration with Kfaraabida in summer 2018.

- Mobile Botanic Garden is initiated, operated and maintained by Green Hand Organization, Aley.

- Awareness components are included within individual projects (Orienting the Rehabilitation of Limestone Quarries in Lebanon: Insights for Mediterranean Environments (ORQUIMED) implemented by Mada Association for example).

- Guided tours in Nature reserves by biodiversity experts.

- Al-Hourouf Association is working on raising the awareness of municipalities and mayors on the importance of biodiversity and its conservation and sustainable management

- Several museums existing in different academic or non-academic institutions.

- Under the Hima programme (community-based management area executed by a local NGO\SPNL with some municipalities) 5 programmes has been established to support local communities, enhance their conservation skills, and build their social and environmental responsibility, especially youth and women, namely:
  - Hima School (School with No Walls-SNOW): aims to raise the capacities of children between the ages of 8 and 12 on the general concepts of conservation related to biodiversity and natural resources.
  - Homat Al-Hima programme: aims to assure the conservation of the site and its key biodiversity, and the ecological and cultural services it provides.
  - Souk Hima Programme: aims to conserve cultural and traditional skills at local communities and to upgrade the livelihood of rural communities within IBAs/HIMAs in Lebanon interlinked with natural resources.
  - Hima to Hima Programme: aims to promote ecotourism activities at Hima sites, link them together, and increase the resilience of local communities through nature-based income generating activities.
  - Hima Farm Programme: promotes values that include organic agriculture, permaculture, sustainable use of resources, no hunting, no child labor, raises capacity of locals, provides jobs for locals & refugees, conserves native plants & herbs.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 12 and National Priority Area 8.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

While this measure contributes to raising awareness on biodiversity, it is limited to the public schools where MEHE is mostly involved and private initiatives that target specific groups. This measure is not implemented at the national level and does not cover all schools. This measure is partially effective.

Relevant websites, web links and files

- www.moe,gov.lb
- www.pinr.me
- www.laas24.org
- www.balamand.edu.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

This is not implemented at the national level, but rather by NGOs, MEHE, and active stakeholders. This should be done in collaboration with MoE. There is a lack of coordination among involved stakeholders.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 12: By 2030, 100% of school and university students and at least 60% of the public are aware of the importance of biodiversity, its values, and the need for its conservation and sustainable use.

Progress towards the implementation of the selected target

☐ On track to exceed target

☒ On track to achieve target

☐ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

- Not all the public and ministries are aware of NBSAP.
- There is a lack of proper mainstreaming among various ministries on developed and implemented initiatives and programs.
- NBSAP should be endorsed by all ministries, and awareness and educational programs should be coordinated among all stakeholders.
- There is a general deficiency in quantitative data in Lebanon, which hinders the ability to properly assess and evaluate status and trends, this is primarily due to the absence of systematic monitoring due to limited resources.

Indicators used in this assessment

1- Number of students enrolled in higher education courses related to biodiversity and environment

2- Number of visitors to Nature Reserves (in particular schools/ universities)

3- Number of environmental clubs in schools and universities, and number of club members

4- Percent of school and university students and the public who are aware of the importance of biodiversity, its values, and the need for its conservation and sustainable use

5- Number of visitors to biodiversity related websites and CHM website

6- Number of publications and media posts related to biodiversity (example: MEA to include awareness about Lebanon's biodiversity and nature reserves in its in-flight advertisements)

7- Number of shows/documentaries about biodiversity and the environment.

Other tools or means used for assessing progress

In the absence of quantitative information on indicators, progress towards the NT was supported by expert discussion and review. Although there is progress, this progress cannot be quantifiable or measurable.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

1- Number of students enrolled in higher education courses related to biodiversity and environment.

Status: Unknown, No available information

Notes:

- Need to contact Ministry of Education to check if statistics on graduate degrees are Recorded.
- Need to contact Universities to check student's enrollment rates in courses related to biodiversity and environment.

2- Number of visitors to Nature Reserves (in particular schools/ universities).

Status: Around 160,000 annual visitors to nature reserves, of which 40% are students; around 20,000 visitors to PINR annually but no data on the number of students.

Notes:

- It is recommended that the MoE regularly collects information on the number of visitors to nature reserves, with emphasis on the number of students.

3- Number of environmental clubs in schools and universities, and number of club members.

Status: Unknown, No available information

Notes:

- Data from the public sector is available at MEHE
- Data from universities is not readily available

4- Percent of school and university students and the public who are aware of the importance of biodiversity, its values, and the need for its conservation and sustainable use.

Status: Unknown, No available information

Notes:

- Activities carried out by MEHE to-date have targeted around 120 health and environment educators in public schools for the forests program, and 110 health and environment educators in public schools (around 14,000 students) for the birds program, the latter was organized in collaboration with the MoE.

5- Number of visitors to biodiversity related websites and CHM website.

Status: Unknown, No available information

Notes:

- Suggestion to Keep only CHM website which is monitored by the MoE drop

6- Number of publications and media posts related to biodiversity (example: MEA to include awareness about Lebanon's biodiversity and nature reserves in its in-flight advertisements).

Status: Unknown, No available information

Notes:

- Suggestion to drop this indicator as such data is hard to acquire and monitor, unless expert companies can be contracted

7- Number of shows/documentaries about biodiversity and the environment of awareness, press, events, media releases, Google trends in Lebanon, related to the topic.

Status: Unknown, No available information

Notes:

- Apart from small segments in talk shows and news, occasional documentaries, and programs pertaining to agriculture and ornamental plants, there are very few shows dedicated to biodiversity and the environment.
- Diaries of the Ocean are preparing 3 animated ads to raise awareness.

NB: Suggestion to drop this indicator as such data is hard to acquire and monitor, unless expert companies can be contracted.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

-

Relevant websites, web links and files

-

NATIONAL TARGET 13

Section I - Information on the targets being pursued at the national level

National Target

Target 13: By 2030, government entities mainstream biodiversity priorities (conservation, benefits sharing, pressure alleviation, sustainable management, sustainable use of natural resources) into their policy making processes and their implementation.

Rationale

There is a need to engage in biodiversity conservation and sustainable use sectors that can have a direct or indirect impact on biodiversity. Consideration for biodiversity should be incorporated into decision-making processes and management activities.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☒ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 9: Mainstreaming Biodiversity into National and Sub-national Policies and Plans.

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 13: By 2030, government entities mainstream biodiversity priorities (conservation, benefits sharing, pressure alleviation, sustainable management, sustainable use of natural resources) into their policy making processes and their implementation.

National Actions

National Actions for National Target 13:

National Action 13.1 Promote the Strategic Environmental Assessment (SEA) Decree (number 8213/2012) in the public sector and institutions at both, the central and local levels

National Action 13.2 Develop guidelines for the implementation of ecological impact assessments as part of the SEA (and EIA) and planning process and provide training sessions

National Action 13.3 Strengthen the capacity of MoE to implement the SEA process (including review) by creating a dedicated unit or expert groups within the ministry

National Action 13.4 Strengthen the planning capacity in all sectors (similar to SISSAF project) and enhance environmental considerations

National Action 13.5 Establish a mechanism to enforce the implementation of environmental measures in national and sectoral strategies and policies such as agriculture, fisheries, forestry, tourism, energy, poverty reduction, sustainable development, land use, water, coastal management, climate change, and disaster risk reduction

National Action 13.6 Hire the necessary technical permanent staff in the departments of the various concerned ministries (e.g. Department of Ecosystems at MoE)

National Action 13.7 Conduct training and capacity building to raise awareness and build technical skills in public institutions concerned with biodiversity conservation; e.g. MoA, MoEHE, DGUP, CDR, MoEW, MoPWT, etc.

National Action 13.8 Raise the awareness of the internal security forces and the municipality police on biodiversity legislation

Measures Taken to contribute to the implementation of NA 13.1

National Action 13.1 Promote the Strategic Environmental Assessment (SEA) Decree (number 8213/2012) in the public sector and institutions at both, the central and local levels

Measure 13.1a: Promoting SEA

- Legislation pertaining to SEAs have been brought to the attention of the public sector and institutions at the central level by the Ministry of Environment.
- Preparation of several SEAs:
  - Update of the SEA for Offshore Petroleum activities in Lebanese Waters (2018): the SEA for the offshore exploration and production activities has integrated NBSAP objectives and targets within its framework of objectives, targets and indicators (including those related to biodiversity protection, invasive species, etc.), and could serve as a model for future sectoral SEAs.

- SEA for Bentael Nature Reserve: SEA for amending the zoning in the buffer zone of Bentael Nature Reserve (zone located in the immediate surroundings of the reserve, extending from its boundaries till 500 m).
- SEA for the Qaraoun catchment Master Plan to identify main ecological habitats, corridors, etc. and promote their preservation. A detailed ecological survey is conducted.
- SEA for the Master Plan (SSRDP) for the Union of Tyre
- SEA for the Master Plan (SSRDP) for Akkar to preserve and protect sensitive areas and hotspots in Akkar, Dinniyyeh and Hermel, which proposed the creation of a national park in the upper mountains of Akkar. The project was not officially adopted, and the national park was not constructed.
- SEA for the National Water Sector Strategy (2014)
- SEA for the Renewable Energy Sector (2014)
- SEA is being developed currently for the Master Plan of the the Union of the Municipalities of Jabal Aamel including Wadi Hojeir Nature Reserve will be initiated soon.
- SEA for the Master Plan of Shouf Biosphere Reserve will be initiated soon.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 13 and National Priority Area 9.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is actively under implementation, so far 10 SEAs have been registered at the MoE, and others are currently under preparation. However, the effectiveness of such SEA studies in protecting biodiversity is yet to be assessed. Nevertheless, some case studies indicate that the process is eventually leading towards better protection of biodiversity from development and sectoral initiatives such as in the case of the SEA for the renewable energy sector which has effectively informing wind project design and EIA studies (e.g. Hawa Akkar project). The MoE is effectively checking compliance of EIA studies with higher-tier SEA studies.

This measure is partially effective as SEA is not yet systematically adopted by government proponents and effectiveness of SEA studies is not yet evaluated.

Relevant websites, web links and files

- http://climatechange.moe.gov.lb/viewfile.aspx?id=249
- www.lpa.gov.lb

Other Relevant Information

The update of the SEA for the offshore oil and gas exploration and production activities in Lebanon is a good example of integration of biodiversity considerations into sector planning. The SEA has effectively integrated relevant Sustainable Development Goals, notably SDGs 14 (Life Below Water) and 15 (Life on Land), as well as Goal 13 (Climate Action) and other relevant SDGs. The SEA also integrated relevant NBSAP objectives into the planning process. The SEA also identified ecologically sensitive areas that should be avoided by offshore oil and gas activities. It also identifies preferred SEA options to protect biodiversity and the environment such as no discharge options for drilling cuttings and fluids.

Relevant websites, web links and files

- www.lpa.gov.lb/sustainability

Obstacles and Scientific and Technical Needs related to the measure taken

- Implementation of SEA recommendations are sometimes hindered by political and economic reasons such as in the case of the SEA for the Water Sector Strategy in Lebanon and SEA for the Master Plan (SSRDP) for Akkar
- Resistance from sectoral ministries and local authorities to undertake the SEA process, largely seen as a bureaucratic process rather than an environmental / sustainability planning tool
- There is a need to enhance awareness on SEA at central and regional/local levels so planners understand the added-value of the SEA process
- Technical capacity of environmental consultants in conducting SEA is limited in Lebanon, though there are some experienced SEA consultants
- There is a lack of monitoring in implementation of SEA at the project implementation level (ie EIA stage)
- There is a lack in effectiveness assessment of SEAs

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 13.2

National Action 13.2 Develop guidelines for the implementation of ecological impact assessments as part of SEA (and EIA) and planning process and provide training sessions

Measure 13.2: Guidelines for SEA implementation

- There are administrative but no technical guidelines for the implementation of ecological impact assessments in SEAs.
- Guidelines for the integration of ecological impact assessment in EIA are being developed for the offshore oil and gas sector

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 13 and National Priority Area 9.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is in the early stages of implementation, where only administrative guidelines exist for ecological impact assessments. Technical guidelines are being developed for some sectoral SEAs. Limited training has been provided so far on this topic. As such this measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

MoE and UNDP have developed a training programme for local authorities (including one for environmental police) with a specific module dedicated to Land Use and Ecosystem Management. The

training programme has been pilot tested and is ready for national delivery. This initiative should enhance the capacity of local authorities in effectively mainstreaming biodiversity protection in their local agenda.

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

There is very limited national technical experience in conducting ecological impact assessment of international standards as part of SEA and EIA studies.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 13.3

National Action 13.3 Strengthen the capacity of MoE to implement the SEA process (including review) by creating a dedicated unit or expert groups within the Ministry.

Measure 13.3 a: Capacity building within MOE

- The MoE has a limited number of professionals; this hinders its ability to create dedicated groups for specific functions; the environmental policy and planning department has a very low number of staff; MoE personnel from all departments are typically involved in the review of SEAs and EIAs depending on availability and also on the sector and expertise of specific staff
- Through the Streg technical assistance project financed by the EU, trainings on SEA and EIA have been provided to MoE personnel

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 13 and National Priority Area 9.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

While MoE personnel is gaining on-the-job knowledge on the review of SEA studies, dedicated training has been limited; MoE has also limited capacity to raise the awareness of sectoral ministries given the low number of staff; nevertheless capacity is improving and the measure is considered to be partially effective.

Relevant websites, web links and files

- www.moe.gov.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

MoE is understaffed and it is challenging to assign personnel for very specific tasks.

There is a need for consistent criteria for the evaluation of SEA/EIA studies so they are not dependent on the composition of the evaluation committee at MoE.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 13.4

National Action 13.4 Strengthen the planning capacity in all sectors (similar to SISSAF project) and enhance environmental considerations

Measure 13.4a: Planning capacity of all sectors

- The Ministry of Environment trained Internal Security Forces and Forest Guards of the MoA particularly in the context of the new hunting law.

- In the context of a pilot training programme initiated by the MOE, supported by UNDP, funded by the Dutch embassy in Lebanon, and jointly implemented by ELARD and Beyond Reform, municipality council members and police were trained on environmental management.

  The pilot training programme (Training Programme for Municipalities to Enhance Environmental Management) focused on municipalities in Akkar and North Lebanon. Invitations were extended to 49 municipalities. A total of 14 council members representing 14 municipalities attended the training, which was held July 31-August 2, 2018. Also 15 members of municipal police representing 12 municipalities attended the training, which was held 23-25 July, 2018.

- The prime minister's office is enforcing the mainstreaming of SDGs in all sectoral strategies; for example the Ministry of Economy and Trade is preparing Lebanon's sustainable development strategy to achieve the SDGs; it does address for example raising awareness among consumers about sustainable consumption.

- NGOs initiatives such as SPNL's related to Hima's participatory framework (Hima is a community based approach used for the conservation of sites, species, habitats, and people in order to achieve the sustainable use of natural resources) that works with municipalities on problem analysis and development of action plans.

- MAVA funded the project entitled "Promoting cultural practices towards positive impact on biodiversity in Chouf Landscape" which is being implemented by the Shouf Biosphere Reserve from 2018 till 2020. The project aims to design and setup monitoring systems and tools to periodically assess the evolution of the ecological and cultural values of the agro-silvo-pastoral systems and traditional practices, the natural habitats, and key species populations and to ensure adaptive management of natural resources, based on the restoration of healthy agro-silvo-pasture systems and cultural practices.

- Migratory Soaring Birds (MSB) Project Stage II promotes mainstreaming in various sectors (hunting, tourism, agriculture). The project has been ongoing since 2018, and is implemented by Bird Life International represented by their partner SPNL.

- Training of trainers programs related to environmental issues are being implemented by MEHE mainly: one program on forests where 110-120 health and environment educators in public schools were trained since 2014, and another program related to birds implemented by MEHE in collaboration with MoE and IFAW in 2017-2018, the program trained 110 health and environment educators in public schools on birds' conservation and the hunting law, and included the preparation of an educational guidebook on this topic that was disseminated to the educators to be used by them for training the students.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 13 and National Priority Area 9.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is partially effective since it was not implemented at the national level and across all sectors. No specific actions were taken by the Ministry of Environment to mainstream biodiversity and environmental considerations in all sectors.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

- There is a lack of joint coordination and mainstreaming among various ministries and sectors, especially pertaining to strategies development and joint considerations. For the majority of other sectors, environmental considerations, while important, are normally regarded as secondary and do not come on top of the list in priority considerations.

- There is generally a weak planning capacity at both central and regional/local levels in Lebanon. If planning is lacking at the first place, mainstreaming biodiversity considerations becomes very challenging.

- There is a lack in awareness on environmental matters during planning.

- There is a need to build capacity in the integration of SDGs in sectoral, regional and local planning.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 13.5

National Action 13.5 Establish a mechanism to enforce the implementation of environmental measures in national and sectoral strategies and policies such as agriculture, fisheries, forestry, tourism, energy, poverty reduction, sustainable development, land use, water, coastal management, climate change, and disaster risk reduction

Measure 13.5a: Development of a mechanism to enforce the implementation of environmental measures in national and sectoral strategies and policies

- The MOA purchased four patrol boats for monitoring fishing activities at sea and started patrols in collaboration with the Lebanese Navy since May 2016. Their main task is to enforce the Lebanese Fishing Law, and its related decrees and ministerial decisions (www.MoA.gov.lb).

- The Lebanese army has created a specialized unit equipped for rapid intervention of marine oil spills accidents. The unit is based at Beirut Naval Army Base and is able to intervene rapidly across the Lebanese waters (www.lebarmy.gov.lb).
- Environmental prosecutors have been appointed as part of the Higher Council for Justice, and the law for creating environmental police was issued in 2014 and the decree regulating the work of the environmental police was issued in 25 August 2016. Currently the MoE is in process of recruiting environmental police as part of MoE's staff.
- "Tyre Caza Platform for Fisheries Legislation Application" a platform established at Tyre as a result of the empowerment of stakeholders on marine management planning. This platform is constituted by concerned ministries, security forces, municipalities, union of municipalities, fishermen cooperatives and syndicates, NGOs and the TCNR. Its vision is to promote sustainable marine ecosystems while fostering economic prosperity across fisheries and the maritime sector. Its main goal is to reduce the use of destructive fishing techniques and landing of protected species, through collaborations and coordination, in order to achieve long-term sustainable fisheries management (www.IUCN.org).
- SPNL has proposed Responsible Hunting Areas (RHAs) to implement the hunting law at the local level by municipalities (to restrict hunting in RHAs), however this proposal still needs official adoption by concerned ministries and needed legislation to regulate it.
- SPNL in partnership with CABS is undertaking field missions aiming to identify and document violations of the hunting law.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 13 and National Priority Area 9.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure did not yet fully achieve its intended outcome, it is restricted to some actions. Much work is still needed to be done so that this measure can achieve its objective and fulfill this NA. This measure is considered to be partially effective.

Relevant websites, web links and files

- www.agriculture.gov.lb
- www.mod.gov.lb

Other Relevant Information

- The Ministry of Environment always officially notifies the Ministries of Agriculture and Interior about violations that fall within their jurisdiction and asks them to take necessary action. For instance, official notifications are sent regularly by the Ministry of Environment to the Ministries of Interior and Agriculture regarding the hunting's regulations, hunting season and the hunting violations, since they are the two official administrations responsible of the hunting law's enforcement and for stopping hunting violations. Additionally the MoE appeals against people who have committed environmental violations at the general environmental prosecutors.
- Key usage areas for water security and tsunami risk to populations and natural coastline protections maps were developed using the UN Biodiversity Lab mapping tool. This could help propose actions needed to be taken to reduce disaster risk based on the susceptibility and severity levels.

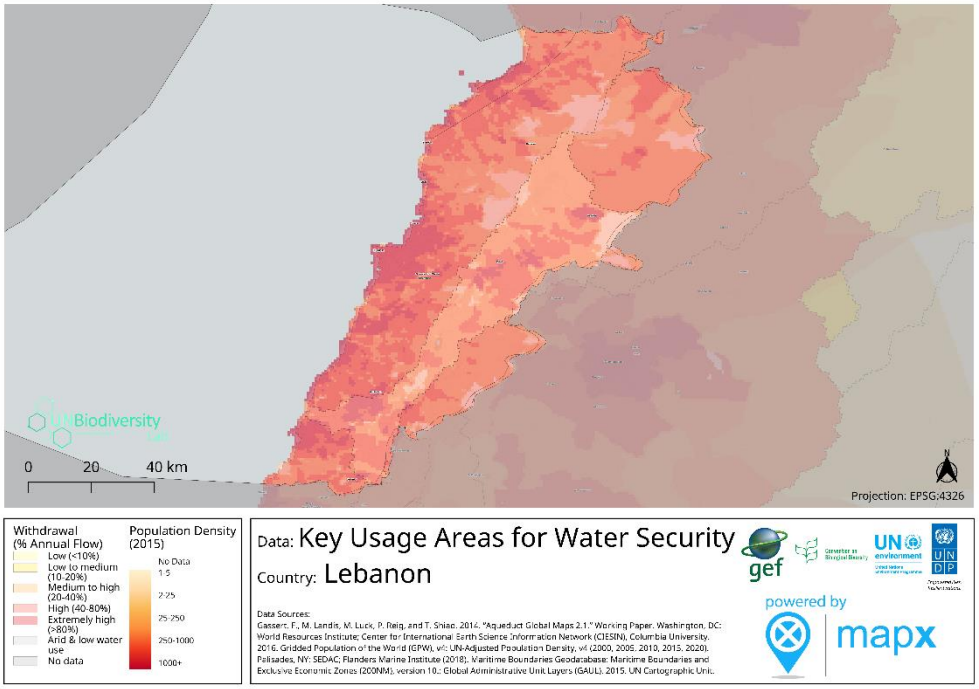


Figure 14 Key Usage Areas for Water Security

Source: UN Biodiversity Lab, 2018

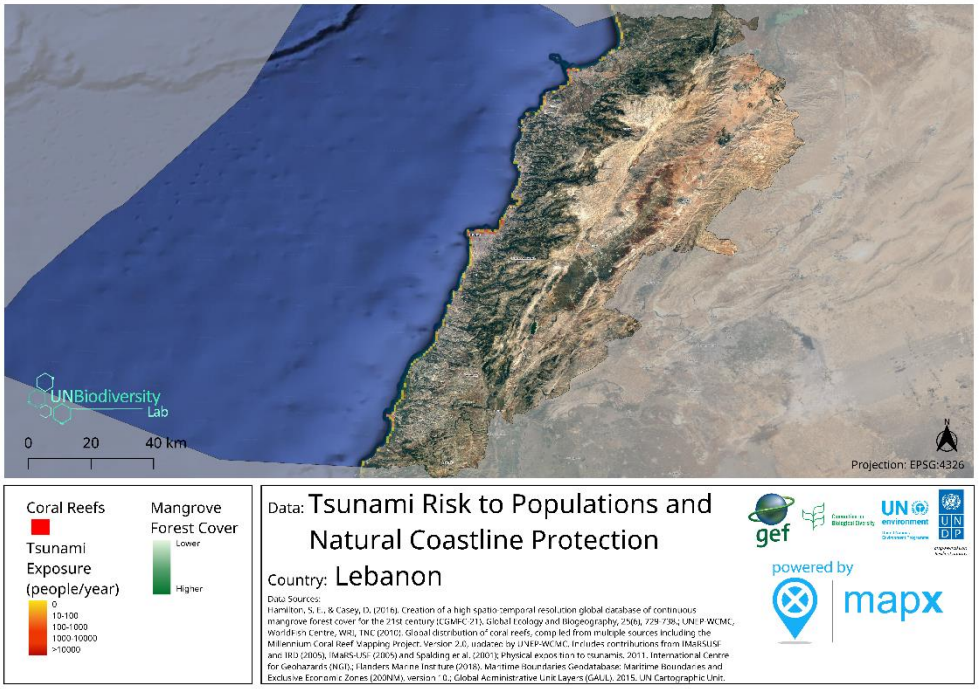


Figure 15 Tsunami Risk to Populations and Natural Coastline Protection

Source: UN Biodiversity Lab, 2018

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

There is lack of resources at the institutional levels needed for such enforcement. For example, the MoA is facing obstacles and patrol boats used for surveillance are not always functional.

MoE doesn't have yet an environmental police in order to stop the environmental violations and issue fines. The law creating an environmental police was issued in 2014 and the decree regulating the work of the environmental police was issued in 25 August 2016, and currently the MoE is in process of recruiting the related officials.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 13.6

National Action 13.6 Hire the necessary technical permanent staff in the departments of the various concerned ministries (e.g. Department of Ecosystems at MoE).

Measure 13.6a: Hire technical staff

- The only identified activity for this measure has been the appointment of Environmental prosecutors as part of the Higher Council for Justice, and currently the MoE is in process of recruiting the environmental police as part of MoE's staff.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 13 and National Priority Area 9.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☒Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is ineffective since it was only implemented in one ministry.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

- Need to strengthen environmental matters at the Institute of Judge Education and possibly include biodiversity in the curriculum.
- There are obstacles related to civil servant hiring; Hiring of new staff is administratively difficult, and the process takes long time.

- There are no environmental departments in sectoral ministries.
- Instead of hiring new dedicated staff, the environmental capacity of existing staff should be enhanced.

There is a need to train specific staff of Ministries on environmental matters as a tool for mainstreaming (rather than hiring new staff, which is difficult)

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 13.7

National Action 13.7 Conduct training and capacity building to raise awareness and build technical skills in public institutions concerned with biodiversity conservation; e.g. MoA, MoEHE, DGUP, CDR, MoEW, MoPWT, etc.

Measure 13.7 a: Conduct training and capacity building in public institutions

- Several training and capacity building sessions were implemented to raise awareness and build technical skills in public institutions concerned with biodiversity conservation. Additionally, MSB Stage II will develop a training module with the Ministry of Tourism on biodiversity for tour operators
- MoE conducted a series of training to ISF and forest guards on the hunting law.
- Training of Trainers was carried out by MEHE in collaboration with MoE in 2017-2018 to the health and environment educators of the public schools on birds' conservation and hunting regulations.
- In the context of the SLMQ project (MoE/UNDP), a consultation meeting was organized on the application of the Integrated Landscape Approach (ILA). The ILA aims to provide the basis for the establishment of an ecological corridor ensuring connectivity between the various patches and an interchange in energy flow and species between patches. The meeting was an opportunity to exchange on the criteria to be adopted to enhance the quality of these landscape matrices, thus responding to Sustainable Forest Management and Sustainable Rangelands Management principles. Addionally, Training of Trainers on rangelands management is planned. The purpose of training is to provide specialists with the necessary skills for implementing studies and collecting reliable, unbiased, and consistent data. The Training of Trainers will focus on the detailed explanation of the National Guidelines for rangeland management. The SLMQ project is also planning trainings on the use of Land Use Information Management systems (LUIMS) including biodiversity indicators.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 13 and National Priority Area 9.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☒Unknown

Tools and Methodology for assessment of effectiveness

This measure is not implemented yet.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

There is a lack of training and capacity building at all institutions.

Biodiversity and environmental issues should be included in sector capacity building and training programmes.

For example: at the Institute of Judicial Education, there is a need to strengthen awareness and knowledge of Judges on environmental matters.

Update training programs to include and raise environmental capacity of existing staff.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 13.8

National Action 13.8 Raise the awareness of the internal security forces and the municipality police on biodiversity legislation.

Measure 13.8a: Awareness raising on biodiversity legislation

- Efforts by the MoE to raise awareness of members of Internal Security Forces, forest guards and municipality police on biodiversity legislation, particularly in the context of hunting, has been ongoing since 2011. Leaflets and booklets on game birds legally allowed to be hunted, species that resemble legal game birds, as well as globally threatened bird species have been prepared and disseminated since 2011.
- Members of the Internal Security Forces and forest guards were trained in the context of the new hunting law. ISF were also trained on forest fire fighting and control.
- MoE and UNDP have developed a training on environmental management for municipal police that have specific modules on SEA/EIA as well as Land Use and Ecosystem Management.
- ISF and related authorities are always invited as main stakeholders in most projects and initiatives related to environmental conservation and sustainable development. This in turn raises their awareness on biodiversity legislations, gaps and needs. One main example is their full participation in the process of drafting the "Purse Seine Sardine Fisheries Management Plan" for the MoA based on the Ecosystem Approach to Fisheries.
- ISF training on fisheries law in 2015 by IUCN: The training was part of a project on sustainable fishing and livelihood support in Tyre, the training was limited to the Coastal Police division of the South that operates from Sarafand to Naqoura (www.IUCN.org).

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 13 and National Priority Area 9.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is actively under implementation, and is effective. The ISF and environmental police are regularly trained and informed. The ISF is the only entity currently acting as environmental police enforcing laws and decisions and taking legal action by those performing environmental crimes, in addition to the forest guards of MoA when the violations are related to forest's resources and fisheries.

Relevant websites, web links and files

- www.IUCN.org

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

ISF training is not enough without proper orders from the existing hierarchy in Lebanon to enforce existing laws and decisions.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 13: By 2030, government entities mainstream biodiversity priorities (conservation, benefits sharing, pressure alleviation, sustainable management, sustainable use of natural resources) into their policy making processes and their implementation.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☒ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

Limitations to the achievement of this target include:

- Limited coordination between government entities, and no endorsement to main strategies and policies.
- Civil servant hiring faces administrative/legal constraints.
- Slow institutional procedures and bureaucracy that delays implementation.
- Limited human resources at MoE to raise awareness of public institutions and stakeholders on SEA/EIA as well as effective integration of biodiversity considerations in these assessments.

Indicators used in this assessment

1- Number of SEAs completed and approved by MoE
2- Number of sectoral policies, plans and strategies addressing biodiversity
3- Number of staff dedicated to or trained in environmental management in sectoral ministries
4- Number of government entities which have included biodiversity priorities into their policy making processes

Other tools or means used for assessing progress

Progress towards the NT was based on collected data and was supported by expert opinion.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;

- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

1- Number of SEAs completed and approved by MoE

Status: 10

Notes:

- Ten SEAs have been completed and approved by MOE so far.

2- Number of sectoral policies, plans and strategies addressing biodiversity.

Status: Unknown

Notes:

- Master Plan, local development of Action Plans and detailed Urban plans for the Qaraoun catchment. It has an SEA component to identify main ecological habitats, corridors, etc. and promote their preservation. A detailed ecological survey is being conducted.
- Master Plans (SSRDP) for Akkar and Tyre which also had an SEA component to preserve and protect sensitive areas and hotspots; in Akkar it was proposed to create a national park in the upper mountains of Akkar. The project was not officially adopted.
- NBSAP 2016
- Strategy for Ministry of Agriculture
- CNRS policy for research funding
- Litani River Business Plan to Combating Pollution
- A national monitoring programme for marine biodiversity in Lebanon was prepared in 2017 by SPA/RAC in close coordination with the Ministry of Environment and it included a national monitoring programme to each of the following: Non-indigenous species (NIS), marine turtles, coastal and marine birds, fisheries, cetaceans and habitats.
- A National Action Plan on marine species introductions and invasive species in Lebanon was developed in 2018 by SPA/RAC in collaboration with MoE
- Master Plan for Municipal Union of Jabal Aamel including Wadi Hojeir Nature Reserve, and master plan for Shouf Biosphere Reserve were completed and their related SEAs are being prepared
- Renewable Energy Strategy
- Oil and Gas Exploration and Production Activities offshore Lebanon

3- Number of staff dedicated to environmental management in sectoral ministries.

Status: Unknown

Notes:

- Staff at MoE
- Staff at MoA
- Staff at MoEW
- Staff at CDR

4- Number of government entities which have included biodiversity priorities into their policy making processes.

Status: Unknown

Notes: the LPA has successfully integrated biodiversity considerations into the offshore oil and gas policies through the SEA process. The same applies to the development of the onshore oil and gas development law which has strong safeguards for biodiversity protection.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

NA

Relevant websites, web links and files

-

NATIONAL TARGET 14

Section I - Information on the targets being pursued at the national level

National Target

Target 14: By 2030, vulnerable ecosystems to climate change are identified and adaptation plans are developed and implemented.

Rationale

Ecosystems vulnerable to climate change exist in Lebanon, therefore, building resilience is crucial to maintain ecosystems functions and reduce threats to biodiversity.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☒ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 10: Climate Change

Relevant websites, web links and files

-

SECTION II. Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 14: By 2030, vulnerable ecosystems to climate change are identified and adaptation plans are developed and implemented.

National Actions

National Actions for National Target 14:

National Action 14.1 Identify key ecosystems vulnerable to climate change and their needs for adaptation

National Action 14.2 Include a chapter dedicated to biodiversity and vulnerable ecosystems in Lebanon's National Communications to the United Nations Framework Convention on Climate Change (UNFCCC)

National Action 14.3 Define pilot national monitoring sites and species, representing the various ecosystems, to monitor medium and long term effects of climate change and implement pilot action to adapt natural ecosystems to climate change

Measures Taken to contribute to the implementation of the NA 14.1

National Action 14.1 Identify key ecosystems vulnerable to climate change and their needs for adaptation

There is **one** main measure that contributes to the implementation of the NA14.1.

Measure 14.1a: Identifying vulnerable ecosystems to climate change

- Key ecosystems vulnerable to climate change have been identified in the context of Lebanon's Third National Communication to the UNFCCC. [MoE/UNDP]
- The "National Greenhouse Gas Inventory Report and Mitigation Analysis for the Land Use, Land-Use Change and Forestry Sector in Lebanon" developed by UNDP and MoE, partially addresses key ecosystems vulnerable to climate change, particularly when it comes to forests.
- The SALMA initiative executed by MoA, also addresses some ecosystems vulnerable to climate change.
- Macroalgal species combination along most of the Lebanese coastline assessed using CARLIT index, adopted and applied by the team of the NCMS-CNRS, exposes also this shallow water habitat, its importance and vulnerability (www.cnrs.edu.lb).
- Marine spatial planning and ecosystem based adaptation for coastal cities will be launched in December 2018 by IUCN.

Contributions by academic institutions to Identifying vulnerable ecosystems to CC:

- Ecosystems vulnerable to fire were identified in the context of fire risk mapping and monitoring (Mitri et al. 2017; International Journal of Disaster Risk Reduction).
- Ecosystems vulnerable to drought were identified in the context of developing a drought index for Lebanon (Mahfouz, Mitri and Karam; International Journal of Climate)
- Firelab system for the dangers of fire, updated in 2018 (George Mitri)
- Academic research, albeit shy, has been launched on marine habitats vulnerable to climate change especially the "Vermetid Platforms". This marine ecosystem will be the most affected by sea level rise, increase in water temperature and acidification. (www.balamand.edu.lb).

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 14 and National Priority Area 10.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Although this measure is actively under implementation, and ongoing research by MoE and other institutions is ongoing, work is still needed in the area of adaptation needs. As such, this measure is partially effective in achieving the desired outcomes for the fulfillment of this NA.

Relevant websites, web links and files

- http://climatechange.moe.gov.lb/viewfile.aspx?id=239
- Badreddine, A., Abboud-Abi Saab, M., Gianni, F., Ballesteros, E., Mangialajo L. First assessment of the Ecological Status in the Levant Basin: application of the CARLIT index along the Lebanese coastline. Ecological Indicators - 85 (2018): 37-47.
- Badreddine A., Milazzo, M, Abboud-Abi Saab, M., Bitar, G., Mangialajo, L. Threatened biogenic formations of the Mediterranean: current status and assessment of the vermetid reefs along the Lebanese coastline (Levant Basin). Ocean & Coastal Management journal. In Press.

Other Relevant Information

- Ecosystems vulnerable to fire were identified in the context of fire risk mapping and monitoring (Mitri et al. 2017; International Journal of Disaster Risk Reduction).
- Ecosystems vulnerable to drought were identified in the context of developing a drought index for Lebanon (Mahfouz, Mitri and Karam; International Journal of Climate)
- Firelab system for the dangers of fire, updated in 2018 (George Mitri - UoB)
- Intended Nationally Determined Constribution (INDC), considered as a national climate change action plan which includes a target on biodiversity.
- Carbon storage in the environment and carbon sequestration potential maps were developed using the UN Biodiversity Lab mapping tool.

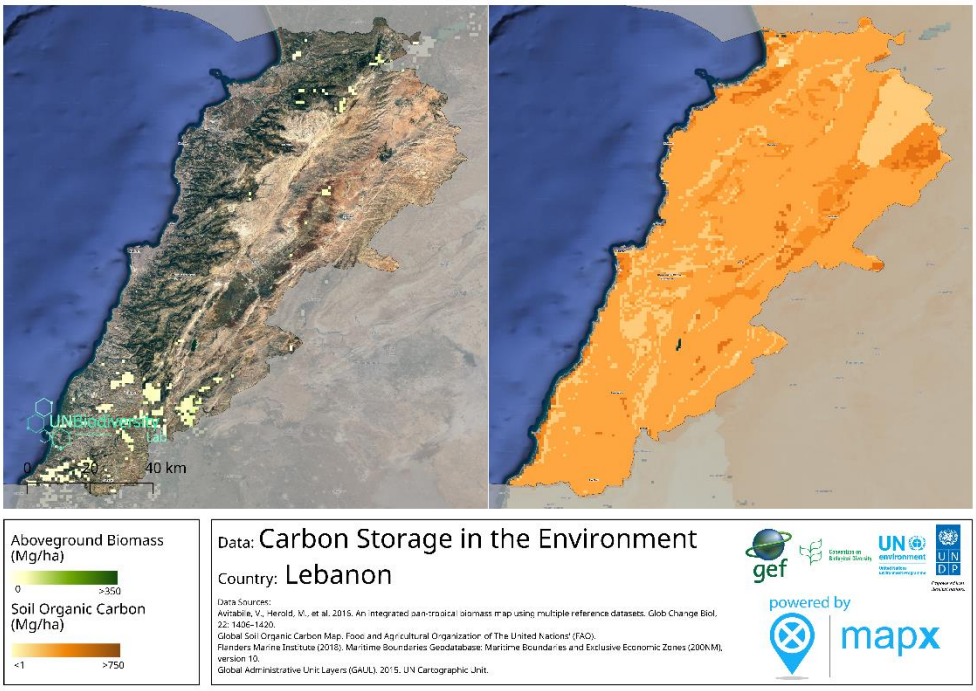


Figure 16 Carbon Storage in the Environment

Source: UN Biodiversity Lab, 2018

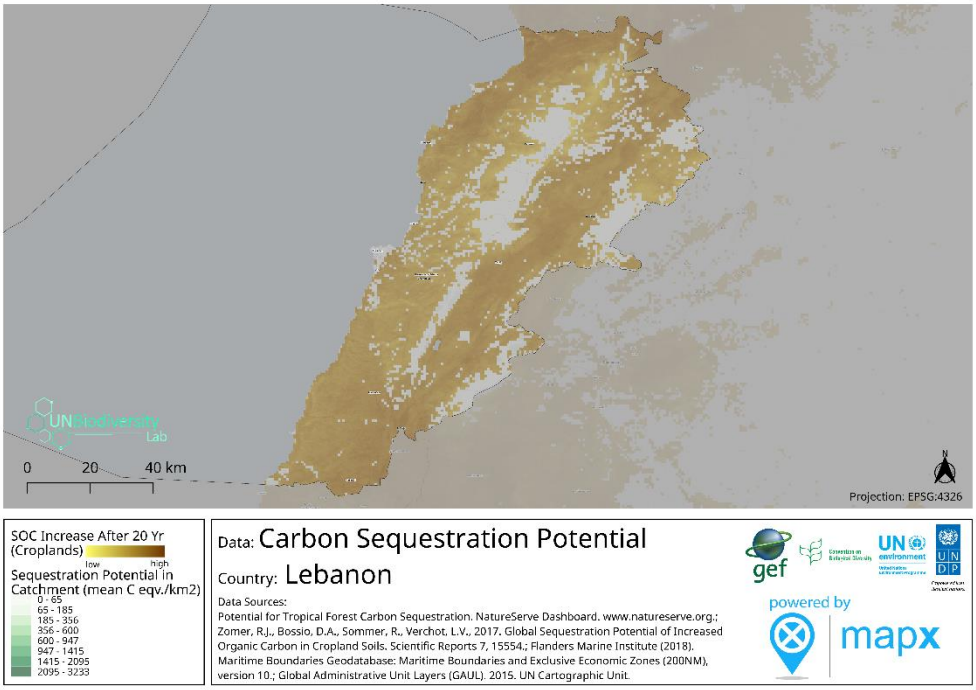


Figure 17 Carbon Sequestration Potential

Source: UN Biodiversity Lab, 2018

Relevant websites, web links and files

- Climatechange.moe.gov.lb
- www.cnrs.edu.lb
- www.agriculture.gov.lb
- Firelab.balamand.edu.lb

Obstacles and Scientific and Technical Needs related to the measure taken

Work needs to be done on the needs for adaptation of key ecosystems vulnerable to climate change.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 14.2

National Action 14.2a: Include a chapter dedicated to biodiversity and vulnerable ecosystems in Lebanon's National Communications to the United Nations Framework Convention on Climate Change (UNFCCC)

There is **one** main measure that contributes to the implementation of the NA14.2.

Measure 14.2a: Including a chapter dedicated to biodiversity and vulnerable ecosystems

- Biodiversity was addressed in Lebanon's Third National Communication to the UNFCCC (MoE\UNDP) whereby it was estimated that the loss of biodiversity due to climate change would impose a coast of about USD 60 million in 2020.
- The "Economic Costs to Lebanon from Climate Change" was part of the "Third Lebanon's National Communications to the United Nations Framework Convention on Climate Change (UNFCCC)" in 2015. This component valuated losses including ones related to reduction in fish harvest and estimated other losses from climate change impacts on ecosystems in terms of reduction in biodiversity, increasing of land degradation and increasing in sea level rise (www.climatechange.moe.gov.lb).

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 14 and National Priority Area 10.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is partially effective since while the report does address biodiversity, it does not fully achieve this NA since it does not provide an extensive description on biodiversity and vulnerable ecosystems.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Lebanon's Third National Communication to the UNFCCC addresses biodiversity however it can be expanded and more developed to constitute more details and a full chapter.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 14.3

National Action 14.3: Define pilot national monitoring sites and species, representing the various ecosystems, to monitor medium and long term effects of climate change and implement pilot action to adapt natural ecosystems to climate change

No measures identified for this NA yet. The « Intended Nationally Determined Contribution» monitors medium and long terms effects of climate change in Lebanon.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 14 and National Priority Area 10.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

The «Intended Nationally Determined Contribution» committee evaluates regularly the predefined targets.

Relevant websites, web links and files

- Climatechange.moe.gov.lb

Other Relevant Information

Marine Spatial Planning and ecosystem vulnerability by IUCN is a project that will be launched and implemented in the very near future (www.IUCN.org).

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

This NA requires long-term commitment which is hard to achieve due to the lack of financial resources.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 14: By 2030, vulnerable ecosystems to climate change are identified and adaptation plans are developed and implemented.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☒ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

There is a general deficiency in quantitative data in Lebanon, which hinders the ability to properly assess and evaluate status and trends, this is primarily due to the absence of systematic monitoring due to limited resources.

Indicators used in this assessment

1. Percent of ecosystem types assessed for vulnerability to climate change
2. Percent of ecosystems vulnerable to climate change with adaptation plans being implemented
3. Percent of national plans and strategies that consider climate change adaptation
4. Number of sectoral plans addressing climate change

Other tools or means used for assessing progress

Indicators and desk review on available studies.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and

- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

Quantitative data not available on indicators.

1. Percent of ecosystem types assessed for vulnerability to climate change

   Status: Unknown, no available information

   Notes:

   - Macroalgal assemblages in shallow waters along 75% of the Lebanese coastal zone assessed (CARLIT Index, www.cnrs.edu.lb).
   - A Forest Registry System is upcoming at the MoA (Anticipated December 2018).

2. Percent of ecosystems vulnerable to climate change with adaptation plans being implemented

   Status: Unknown, no available information

   Notes:

   - Fire hazard and vulnerability areas (forests) have been mapped and adaptation plans identified.

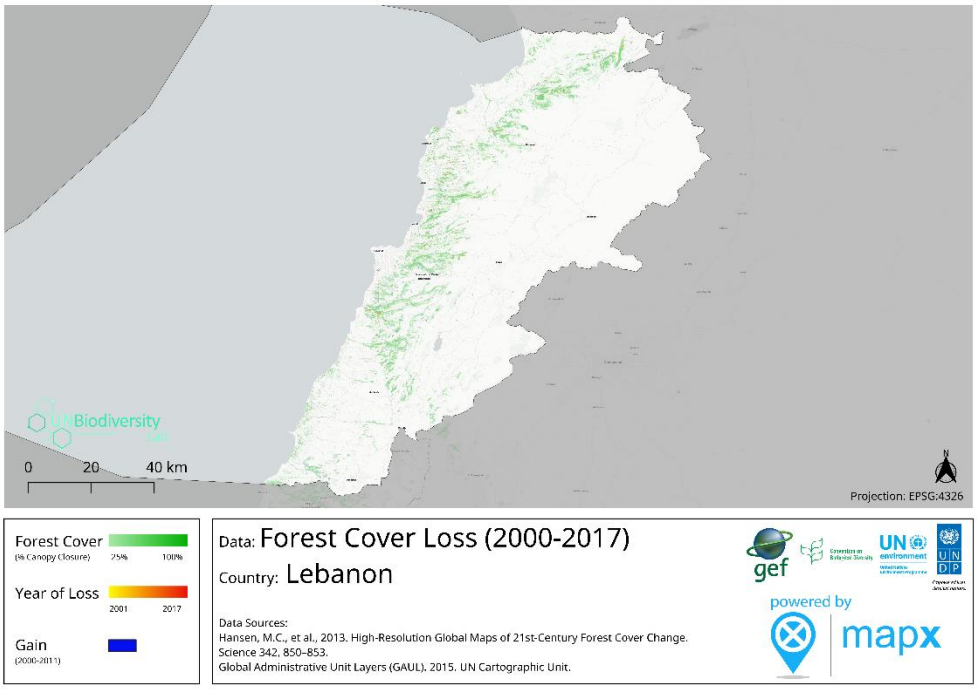


Figure 18 Forest Cover Loss (2000-2017)

Source: UN Biodiversity Lab, 2018

3. Percent of national plans and strategies that consider climate change adaptation

   Status: Unknown, no available information

   Notes:

- Fire hazard and vulnerability areas have been mapped (Fire risk map by Mitri et al.).

4. Number of sectoral plans addressing climate change

   Status: Unknown, no available information

   Notes:

   - Forest and Rangeland Resources Assessment (Anticipated December 2019)
   - As part of the "Third Lebanon's National Communications to the United Nations Framework Convention on Climate Change (UNFCCC)several related reports where drafted entitled "National Greenhouse Gas Inventory Report and Mitigation Analysis" for different sectors:
     - Agriculture Sector in Lebanon
     - Land Use, Land-Use change and Forestry in Lebanon
     - Industrial Processes
     - Waste Sector
     - Transport Sector
     - Energy Sector

     These reports include mitigation measures and scenarios for sources of greenhouse gases emissions for each of these sectors.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

-

Relevant websites, web links and files

-

NATIONAL TARGET 15

Section I - Information on the targets being pursued at the national level

National Target

Target 15: By 2030, research on biodiversity is improved in Lebanon, and research outputs and biodiversity related reports are shared through a centralized platform (from both public and private institutions), which is updated and made accessible to the public (CHM).

Rationale

There is a lack in biodiversity data in Lebanon which makes it harder to manage threats. The centralized database must be completed and continuously updated and accessible to the general public.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☒ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☒ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 11: Research and Knowledge Transfer.

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 15: By 2030, research on biodiversity is improved in Lebanon, and research outputs and biodiversity related reports are shared through a centralized platform (from both public and private institutions), which is updated and made accessible to the public (CHM).

National Actions

National Actions for National Target 15:

National Action 15.1 Create a Research and Information Unit responsible for centralizing biodiversity related information and coordinating the works between the multiple stakeholders, mainly public, private, academics and NGOs

National Action 15.2 Identify priority areas of research in the biodiversity field

National Action 15.3 Update the national Science Technology and Innovation Policy (STIP) to include biodiversity as a priority and define the areas where research is needed within the biodiversity sector

National Action 15.4 Allocate larger budgets for research on biodiversity valorization: conservation, sustainable management, and economic valuation

Measures Taken to contribute to the implementation of NA 15.1

National Action 15.1: Create a Research and Information Unit responsible for centralizing biodiversity related information and coordinating the works between the multiple stakeholders, mainly public, private, academics and NGOs.

There is **one** main measure that contributes to the implementation of the NA15.1.

Measure 15.1a: Centralizing biodiversity related information

- Lebanon has created in December 2016 its National Clearing-House Mechanism (CHM) http://www.biodiv.be/liban, which is a web-based platform and site on biodiversity linked to the Clearing-House Mechanism of the Convention on Biological Diversity (CBD), as part of Lebanon's obligation under the CBD. A national training was held at the MoE on 14, 15 and 16 December 2016 for the administrators and the different contributors from MoE as well as contributors from the different concerned governmental institutions, academic institutions and research centers. The training was conducted by a CHM regional trainer, and aimed to train the future managers and contributors to the national CHM portal on how the portal works and how each stakeholder can contribute to this information sharing platform. The main sections of the national CHM were filled with needed data starting January 2017. However, the interactive portal is still not yet put in use.
- In the framework of the "Market Policy and Legislative Development for Mainstreaming the Sustainable Management of Marine and Coastal Ecosystems in Lebanon" project, the MoE implemented an activity on coastal and marine biodiversity data collection and biodiversity reporting. A centralized library was initiated at the MOE, as a first step available data on coastal and marine biodiversity was collected from different institutions in Lebanon. After a data classification system was set up in the aim of disseminating collected information in the

most practical and easy way. More than 800 documents were gathered. This data was posted on Lebanon Clearing-House Mechanism (CHM)

- O-LIFE observatory initiative joining experts from different institutions working on different fields related to biodiversity. It can be considered as a stepping stone for a wider and national initiative.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 15 and National Priority Area 11.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is in early implementation phase, since both initiatives are not final. The interactive portal of the national CHM is not operational yet and O-life's observatory is functional based on personal initiatives without proper funding and that does not ensure regular updating and comprehensiveness. This measure is partially effective.

Relevant websites, web links and files

- http://www.biodiv.be/liban
- www.cnrs.edu.lb
- www.moe.gov.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

- The main challenge pertaining to the CHM remains in the commitment of all the contributors to start actively and consistently using the interactive portal once it becomes fully operational in order to sustain it.
- O-LiFE by CNRS initiated an online Biodiversity library that aims at compiling all literature on biodiversity in Lebanon (technical report, theses, books, papers, etc.). However, it is not available to all stakeholders.
- Many graduate thesis are undertaken at major universities in Lebanon on marine biodiversity and ecosystem management, but no centralized platform has been established yet leaving such important works out of reach of interested individuals/parties.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 15.2

National Action 15.2: Identify priority areas of research in the biodiversity field.

There is **one** main measure that contributes to the implementation of the NA15.1.

Measure 15.2a: Priority areas of research

- Within the "Integrated Monitoring and Assessment programme (IMAP)" executed at regional level by the Regional Activity Centre for Specially Protected Areas RAC/SPA, a national monitoring programme for marine biodiversity in Lebanon was prepared in 2017 by RAC/SPA in close coordination with the Ministry of Environment and it included a national monitoring programme to each of the following: Non-indigenous species (NIS), marine turtles, coastal and marine birds, fisheries, cetaceans and habitats. In addition, a national action plan on marine species introductions and invasive species in Lebanon was prepared in 2018 by RAC/SPA in close coordination with the Ministry of Environment (www.moe.gov.lb ; www.rac-spa.org).
- The Lebanese National Council for Scientific Research (CNRS-L) Grant Research Program (GRP) considers biodiversity a priority.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 15 and National Priority Area 11.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☒Unknown

Tools and Methodology for assessment of effectiveness

No further measures have been taken nor funds been allocated by related authorities, this measure is ineffective.

Relevant websites, web links and files

- www.moe.gov.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Biodiversity is not always a priority in Lebanon.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 15.3

National Action 15.3 Update the national Science Technology and Innovation Policy (STIP) to include biodiversity as a priority and define the areas where research is needed within the biodiversity sector.

No identified measures for this NA.

Contribution to the Aichi Biodiversity Targets or National Targets

-

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

No update was carried out.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 15.4

National Action 15.4: Allocate larger budgets for research on biodiversity valorization: conservation, sustainable management, and economic valuation.

No measures identified for this NA.

Contribution to the Aichi Biodiversity Targets or National Targets

-

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Shortage of funding remains a major obstacle towards achieving this national action.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 15: By 2030, research on biodiversity is improved in Lebanon, and research outputs and biodiversity related reports are shared through a centralized platform (from both public and private institutions), which is updated and made accessible to the public (CHM).

Progress towards the implementation of the selected target

☐ On track to exceed target

☒ On track to achieve target

☐ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018

Additional information

There is a general increase in the number of publications research related to biodiversity, However, this cannot be quantified as there is a general deficiency in quantitative data in Lebanon, which hinders the ability to properly assess and evaluate status and trends, this is primarily due to the absence of systematic monitoring due to limited resources.

Regarding the national CHM, work is on-going to update the content and data, and it is planned to initiate in 2019 the operation of the interactive portal with the different contributors from the various concerned institutions in Lebanon.

Indicators used in this assessment

1- Number of publications related to biodiversity by type of publication: scientific publications, textbooks, general interest, children's books, etc.

2- Number of visitors to the CHM created platform.

3- Number of contributors to the CHM, posting biodiversity related research and publications.

4- Number of biodiversity related research, studies and publications posted in the CHM

5- Number of relevant posts/tweets/etc. on social media

6- Number of publications mentioned in local media

7- Amount of budget allocated for related research

8- Number of projects allocated for related research

9- Amount of budget allocated for scholarships and grants related to research studies (Number of announcements/ Number of grants etc.)

10- Number of downloads of the publications and various documents from the CHM.

Other tools or means used for assessing progress

With the absence of quantitative information on all the indicators, progress towards the NT was supported by expert discussion and desk review.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

1- Number of publications related to biodiversity by type of publication: scientific publications, textbooks, general interest, children's books, etc.

Status: unknown, but increasing
Notes:

- 850 documents including scientific papers related to the marine and coastal environments have been identified and classified.
- In 2016, an "Updating of 2002 SAP-BIO National Report" was done based on desk review in order to create and enable integrated framework for sustainable management and conservation of coastal and marine biodiversity and at mainstreaming priorities of biodiversity issues into national plans and coastal zone management (CZM) plans. Moreover, the new report updated the existing coastal faunal and floral species lists following an expert focus group meeting (www.moe.gov.lb).

2- Number of visitors to the CHM created platform
Status: unknown
Notes:

- Public referencing and searching utility is yet to be developed.

3- Number of contributors to the CHM, posting biodiversity related research and publications

Status: NA
Notes: -

The interactive platform of the national CHM is not yet functional.

4- Number of biodiversity related research, studies and publications posted in the CHM

Status: NA
Notes: -

5- Number of relevant posts/tweets/etc. on social media

Status: unknown
Notes:

- Suggestion to drop this indicator

6- Number of publications mentioned in local media

Status: Unknown

7- Amount of budget allocated for related research

Status: unknown, no information
Notes:

- Limited to public research centers and the Lebanese university:
    - Ca. 50,000 USD per year are allocated for biodiversity research by CNRS-L.
    - Lebanese university: Unknown

8- Number of projects allocated for related research

Status: Unknown, no information
Notes:

- Limited to public research centers and the Lebanese university:
    - CNRS-L funds 3 projects pertaining to biodiversity each year.
    - Lebanese university: Unknown

9- Amount of budget allocated for scholarships and grants related to research studies (Number of announcements/ Number of grants etc.)

Status: unknown, no information
Notes:

- Limited to public research centers and the Lebanese university:
- Limited to public research centers and the Lebanese university:
    - CNRS-L funds one graduate student conducting research in the field of biodiversity every other year
    - Lebanese university: Unknown

10- Number of downloads of the publications and various documents from the CHM

Status: Unknown, no information
Notes:

- The national CHM of Lebanon (http://www.biodiv.be/liban) was created in December 2016; at the time, a national training was held at the MoE. Administrators as well as different contributors from the Ministry of Environment, the different concerned governmental institutions, academic institutions and research centers were trained on how the portal works and how each stakeholder can contribute to this information-sharing platform.
- Information and reports related to biodiversity are posted at the national CHM; however, the interactive portal is not yet in use. Currently, the Ministry of Environment is working to update the data published in the national CHM, and to initiate the operation of the interactive portal with the different contributors from the various concerned institutions in Lebanon.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

-

Relevant websites, web links and files

-

NATIONAL TARGET 16

Section I - Information on the targets being pursued at the national level

National Target

Target 16: By 2030, traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources are documented, preserved, and shared/published.

Rationale

There is a lack in biodiversity data in Lebanon which makes it harder to manage threats. The centralized database must be completed and continuously updated and accessible to the general public.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☒ 19
☐ 5	☐ 10	☐ 15	☐ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☒ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 11: Research and Knowledge Transfer.

Relevant websites, web links and files

-

Section II. Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 16: By 2030, traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources are documented, preserved, and shared/published

National Actions

National Actions for National Target 15:

National Action 16.1 Prepare a survey of assessment on the traditional use of folk medicine, herbals, food and feed, seed production and preservation, flora and fauna uses and agricultural practices. The survey will be published once completed

National Action 16.2 Plan festivals exhibiting local and traditional practices in different localities of Lebanon. Those festivals could be expanded all over the country

Measures Taken to contribute to the implementation of the NA 16.1

National Action 16.1: Prepare a survey of assessment on the traditional use of folk medicine, herbals, food and feed, seed production and preservation, flora and fauna uses and agricultural practices. The survey will be published once completed

There is **one** main measure that contributes to the implementation of the NA16.1.

Measure 16.1a: Survey of assessment on traditional use

- MEDARTSAL project implemented at Enfeh tackling Salinas which are facing many threats due to change of social values and economic stresses, the project aim to adopt coordinated actions to define and implement a model for the sustainable management of artisanal Salinas which includes a strategic plan for the marketing of products associated with the management of artisanal salt works.
- The Shouf Biosphere Reserve is reviving cultural practices as a tool to improve the ecosystem resilience to climate change. It is, for example using traditional knowledge to restore the old abandoned terraces located in the buffer and development zones of the Reserve, and planting them with many native species with high economic value. To complete the cycle, and following traditional methods and recipes, women associations and cooperatives use these species to produce high quality food products such as dried oregano, cedar honey, gundelia (cooked or conserved), etc.

Contributions from private initiatives:

- List of flora in Mount Hermon with emphasis on medicinal plants (Baydoun et al. 2015 and Arnold et al. 2015 for example).
- Publications by Beyrouthy (USEK) listed under Target 2 also contribute to the achievement of this national action.
- An assessment of traditional foods was undertaken by TERCOM in the context of the Nawara project.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 16 and National Priority Area 11.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

The MEDARTSAL project is a recent project in its early phases of implementation. This measure is partially effective.

Relevant websites, web links and files

- www.moe.gov.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

-

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of the NA16.2

National Action 16.2: Plan festivals exhibiting local and traditional practices in different localities of Lebanon. Those festivals could be expanded all over the country

There is **one** main measure that contributes to the implementation of the NA16.2.

Measure 16.2a: Organizing festivals and exhibitions at the private level

- Numerous exhibitions and festivals are conducted in different parts of the country: Grape festival in Zahle; cherry and apple festival in Bekfaya; grape molasses exhibition in Rachaya.
- Some non-governmental organizations such as Jabalna organize yearly festivals in collaboration with Shouf Biosphere Reserve, exhibiting local and traditional practices. For instance, Jabalna organized a one-day festival that focused on wild plants at the Shouf Cedar Reserve this year.
- Fishing competitions organized by NGOs along the Lebanese coastline, e.g. (www.fishinginLebanon.com).
- Most Protected Areas exhibit local and traditional food and handicrafts at their entrance and in their visitors center.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 16 and National Priority Area 11.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is actively under implementation; however, the government needs to work on expanding these festivals to different parts of the country. Such festivals also need to focus on local and traditional practices pertaining to biodiversity and its sustainable use. As such, this measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Such festivals are carried out by the nature reserves teams, private initiatives and NGOs. They are often undocumented and limited to certain localities.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 16: By 2030, traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources are documented, preserved, and shared/published

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☐ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☒ Unknown

Date the assessment was done

December 2018.

Additional information

There is a general deficiency in quantitative data in Lebanon, which hinders the ability to properly assess and evaluate status and trends, this is primarily due to the absence of systematic monitoring due to limited resources.

Indicators used in this assessment

1- Number of actions taken to preserve traditional knowledge, uses, and practices of local communities

2- Number of documents (articles/ books) published on traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources

3- Number of public conferences and number of documented public events on traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources

4- Number of documentaries relevant to traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources

5- Amount of budget allocated for research on traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources

Other tools or means used for assessing progress

Based on data collected on indicators and supported by expert opinion.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☐ Based on partial evidence

☒ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

1- Number of actions taken to preserve traditional knowledge, uses, and practices of local communities.

Status: No quantitative information

Notes:

- The IUCN and ADR has implemented between January 2014 to September 2017 Sustainable Fisheries Management for Improved Livelihoods of the Coastal Fishing Community in Tyre, South Lebanon project, which was funded by DROSOS foundation. The project aims at empowering the fishermen as well as providing them with improved status of life. This project also aims at ensuring sustainable fishery to preserve the marine biodiversity while not hindering the fishing economy.

  Also the IUCN, in partnership with South Lebanon Fishermen Syndicate developed several activities to reach the five main goals set:

  - Implementing a simple and effective monitoring system covering 60% of the fishing activity.
  - Elaborating a sustainable fisheries management plan.
  - Developing an effective local governance system for the fisheries of Tyre.
  - Generating 1,000 USD/month (starting from 2nd year) of benefits through the management of improved fish storage, processing and marketing facilities.
  - Establishing a sustainable fisheries platform, this platform brought together, administrations, fishermen and scientists providing the best mix of regulations, local knowledge and science for improved sustainable fishing.
  - All marine surveys in Tyre were conducted using fishermen vessels.
  - Prior to selection of the sites for underwater surveys fishermen were consulted, and information shared was key in the selection of the survey sites.
  - https://www.youtube.com/watch?v=3FG6jqRR1zY

- Three projects involving terrace/quarry rehabilitation have been implemented at the Shouf Biosphere Reserve since 2015:

  - Mediterranean Mosaics: Strengthening the Resilience of Mediterranean Landscapes of socio-economic and climate change. The project aims to implement forest restoration and management measures using a mix of traditional know-how and innovative technology. The project is funded by MAVA, and the first phase of the project was executed between 2012 and 2015 and aimed to design a pilot landscape

restoration plan. The implementation started during the second phase of the projects, which runs between 2015 and 2019 (www.mediterraneanmosaics.org).

- M6: Building the ecologic and socio-economic resilience of the Shouf Mountain Landscape by restoring and strengthening the socio-cultural fabric which sustains its biodiversity and cultural values. The project aims to design and setup monitoring systems and tools to periodically assess the evolution of the ecological and cultural values of the agro-silvo pastoral systems and traditional practices, the natural habitats, and key species populations. The project is funded by MAVA in partnership with SPNL, and is being implemented by the Shouf Biosphere Reserve from 2018 till 2020.
- STONE: Restoration and enhancement of traditional agricultural systems for the economic development and the environmental conservation of the Shouf Biosphere Reserve. The project is funded by the Italian Ministry of Foreign Affairs in partnership with Italian Oikos Institute, and is being implemented between 2018 and 2021.

- Through the LRI project, vegetation distribution studies were updated taking in consideration input from the local communities. Species planted in each site were discussed with the town leaders and elderly to combine LRI's technical knowledge on species suitability with eye witness information on pre-existing vegetation cover, in addition to considerations related to climate change impact on species distribution to come up with the best combination of species for each reforested location. Community engagement work in each partner community focused largely on adopting and adapting planting practices based on traditional practices but ensuring they are adapted well to improve seedling survival rate and worker productivity.

  LRI has also been working with local communities and specifically women cooperatives, to encourage sustainable use of non-wood forest products, spreading further the knowledge about the economic value and uses of different local species and turning them into sustainable value chains.

- MEDARTSAL project expected to start in July 2019 across the Mediterranean with one pilot site in Lebanon, focusing on the Salinas of Anfeh which are facing many threats due to change of social values and economic stresses.

- Most nature reserves are executing programs about rural development and programs to preserve and revive traditional knowledge, uses and practices of local communities surrounding the reserves; mainly in traditional food, handcraft, and agricultural and forestry traditional practices.

2- Number of documents (articles/ books) published on traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources

Status: No quantitative information

Notes:

- Pamphlets and brochures are occasionally published mostly by MoA, LARI, and NGOs in the context of implementing projects or awareness campaigns.

- Diaries of the Ocean developed a sustainable fisheries application.

3- Number of public conferences and number of documented public events on traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources

Status: No quantitative information

Notes: -

4- Number of documentaries relevant to traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources

Status: No quantitative information

Notes:

- Some episodes of Nature (by Marc Beyrouthy, MTV)
- Diaries of the Ocean developed on sustainable fishing.

5- Amount of budget allocated for research on traditional knowledge, uses, and practices of local communities relevant to biodiversity and sustainable use of resources

Status: No quantitative information

Notes:

- Little international funding for some projects

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

-

Relevant websites, web links and files

-

NATIONAL TARGET 17

Section I - Information on the targets being pursued at the national level

National Target

Target 17: By 2030, the relevant institutional and legal framework and government policies are reviewed, updated and reinforced where necessary to ensure effective biodiversity conservation and sustainable use.

Rationale

Major gap in the Lebanese legal framework for biodiversity lies in the enforcement of legislation. Significant works need to be done in order to enact new legislation and enforce/amend existing ones.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☒ 1	☐ 6	☐ 11	☐ 16
☒ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☒ 19
☐ 5	☐ 10	☐ 15	☒ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 12: Institutional and Legal Framework

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 17: By 2030, the relevant institutional and legal framework and government policies are reviewed, updated and reinforced where necessary to ensure effective biodiversity conservation and sustainable use.

National Actions

National Actions for National Target 17:

National Action 17.1 Train ISF inspectors on environmental matters and create within the ISF a dedicated unit to control environmental violations until the establishment of an environmental police

National Action 17.2 Establish the environmental police

National Action 17.3 Raise the awareness of the ISF and the municipality police on biodiversity legislation

National Action 17.4 Review the existing environmental legislation, make necessary amendments and prepare all remaining implementation Decrees, and draft new laws where needed

National Action 17.5 Engage inspectors from other sectors (tourism, agriculture etc.) in the identification and reporting of environmental violations

National Action 17.6 Provide the MoJ with all existing environmental legislation and train judges

National Action 17.7 Integrate the biodiversity agenda in the National Council for the Environment (NCE) to enhance coordination

Measures Taken to contribute to the implementation of NA 17.1

National Action 17.1 Train ISF inspectors on environmental matters and create within the ISF a dedicated unit to control environmental violations until the establishment of an environmental police

Measure 17.1 a: ISF Training

- MoE has organized in 2017 and 2018 a series of training and capacity building sessions for the officers responsible of hunting law enforcement, about the provisions of the hunting law and the identification of birds of preys (allowed for hunting during the hunting season), and their differentiation from the look-alike birds species prohibited for hunting, as follows:
    - In 2017 within the STREG Project (funded by EU), the training targeted 184 ISF participants and 113 forest guards of the Ministry of Agriculture.
    - In 2018, in collaboration with the NGO "Environment for Life" and with funds from the GEF Small Grant Programme, the training targeted 143 ISF participants.

Figure 19 Photographic Documentation of some ISF Training Sessions

Contribution to the Aichi Biodiversity Targets or National Targets

Contributes to the NT 17 and National Priority Area 12: Institutional and Legal Framework

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

A dedicated unit within ISF in charge of controlling environmental violations has not been created; ISF inspectors were only trained in the context of the new hunting law, as such this measure is still in early implementation phase and more work needs to be done to fulfill the requirements of this NA. This measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

A dedicated unit within ISF in charge of controlling environmental violations has not been created. Such a unit would ease the integration of knowledge and training on environmental issues and not just hunting. However, implementation of such structural institutional changes in Lebanese institutions faces significance resistance from policy and decision makers.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 17.2

National Action 17.2 Establish the environmental police

Measure 17.2 a: Establishment of environmental police

- Decree number 3989/2016, issued on 25/8/2016, establishes the environmental police and specifies its constituencies and duties. The decree is however not yet implemented, and the environmental police is not in place yet (the recruitment process of the members of the environmental police will be initiated very soon).

Contribution to the Aichi Biodiversity Targets or National Targets

Contributes to the NT 17 and National Priority Area 12: Institutional and Legal Framework

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Measure taken has been partially effective, as the establishment of the environmental police is pending recruitment of its constituencies by the Civil Service Council.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Administrative bureaucracy delaying mobilization of the environmental police.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 17.3

National Action 17.3 Raise the awareness of the ISF and the municipality police on biodiversity legislation

Measure 17.3a: Awareness Raising on biodiversity legislation

- Training of ISF inspectors has been undertaken in the context of the new law on hunting, and in the context of early warning system on forest fires.
- Efforts by the MoE to raise awareness of members of Internal Security Forces, forest guards and municipality police on biodiversity legislation, particularly in the context of hunting law and regulation, has been ongoing since 2011. Leaflets and booklets on hunting law and legislation, game birds allowed legally to be hunted, protected species that resemble legal game birds, as well as globally threatened bird species have been prepared and disseminated since 2011. In addition, MoE has created a specific website on hunting (http://hunting.moe.gov.lb), where all information related to hunting regulations are posted.
- ISF and related authorities are always invited as main stakeholders in most projects and initiatives related to environmental conservation and sustainable development. This in turn raises their awareness on biodiversity legislations, gaps and needs; e.g. One main example is their full participation in the process of drafting the "Purse Seine Sardine Fisheries Management Plan" for the MoA based on the Ecosystem Approach to Fisheries.
- Lebanon Reforestation Initiative (LRI) trained the police of some municipalities on wild fire risk management.
- MoE and UNDP have organized a training on environmental management for municipalities and municipal police that have specific modules on SEA/EIA as well as Land Use and Ecosystem Management.

Contribution to the Aichi Biodiversity Targets or National Targets

Contributes to the NT 17 and National Priority Area 12: Institutional and Legal Framework.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

This measure is under implementation; however, it is partially effective since its main focus has been on the hunting law. Whilst other activities cover other biodiversity issues, they are not as comprehensive as needed. This measure has been partially effective.

Relevant websites, web links and files

- www.interior.gov.lb
- www.moe.gov.lb
- http://hunting.moe.gov.lb

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

ISF training on biodiversity legislation is not enough without proper orders from the existing hierarchy in Lebanon to enforce existing laws and decisions.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 17.4

National Action 17.4 Review the existing environmental legislation, make necessary amendments and prepare all remaining implementation Decrees, and draft new laws where needed

Measure 17.4a: Review legislations

- The access and benefit-sharing draft national law and the draft national biosafety decree and the draft law on CZM are at the Council of Ministers. The protected areas draft framework law is at the Parliament.
- Follow up on the new draft framework law on fisheries and aquaculture by MoA submitted to the Parliament for endorsement.
- Draft law on the management of plant genetic resources for food and agriculture has been prepared by MoA and submitted to the CoM.
- The hunting law is being updated by MoE, to include the municipal police and the environmental police as enforcement agents; it is currently under review at the CoM.
- Forest Law is being updated towards the enhancement of the forest and natural resources management to reach forest management in line with biodiversity conservation and the SDGs
- The Integrated Solid Waste Management Law has been adopted by parliament (Law 80/2018).

Contribution to the Aichi Biodiversity Targets or National Targets

Contributes to the NT 17 and National Priority Area 12: Institutional and Legal Framework

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Several new environmental legislations have been promulgated or draft prepared, or existing laws updated in the past 3 years. Follow up on draft laws is being supported by different lobbies from public and private institutions. While this work is important, however the process of endorsement of new draft legislation takes long time at the CoM and Parliament levels. This measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Need to develop an action plan with all needed environmental legislation to complete the legal corpus for the protection of the environment.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 17.5

National Action 17.5 Engage inspectors from other sectors (tourism, agriculture etc.) in the identification and reporting of environmental violations

Measure 17.5a:

- The Ministry of Environment reports noted violations to other institutions and asks for action on a regular basis (eg to ISF, MoA).
- In 2017 and 2018 MoE has organized a series of training on the hunting law enforcement. In 2017, the training was organized within the STREG Project (funded by EU), and targeted 184 ISF participants and 113 forest guards of the Ministry of Agriculture, in 2018, it was organized in collaboration of EFL (NGOs) from GEF small grant funds and it targeted 143 ISF participants
- Municipalities usually report violations to the Ministry of Environment.
- Customs also report violations, particularly those pertaining to CITES.
- There are inter-ministerial committees on issues related to Environmental Impact Assessments.
- The MoA rangers cover all main fishing harbors in Lebanon. Their main task is to enforce the Lebanese Fishing Law, and its related decrees and ministerial decisions. Rangers also cover the forestry sector creating a tremendous challenge to manage time and resources. Recently the MoA succeeded in purchasing four patrol boats for monitoring fishing activities at sea and rangers started patrols at sea in collaboration with the Lebanese Navy since May 2016 (www.agriculture.gov.lb).
- As a result of the establishment of the "Tyre Caza Platform for Fisheries Legislation Application", the municipality is contributing in enforcing related fishing laws (www.IUCN.org).
- Cooperation in the enforcement of the hunting law is high.
- Cooperation between MoA and ISF is on-going to destroy crops irrigated with polluted water.

Contribution to the Aichi Biodiversity Targets or National Targets

Contributes to the NT 17 and National Priority Area 12: Institutional and Legal Framework.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Despite the principle of cooperation and coordination among departments and institutions, inspectors from other sectors are not always engaged in routine activities. Additionally, several obstacles face the optimum enforcement of laws with the lack of required staff, resources and logistics topping the list. This measure whilst ongoing efforts exist, does not meet fully the intended objective due to the lack of a network that is fully organized and operational. This measure is partially effective.

Relevant websites, web links and files

- www.agriculture.gov.lb
- www.IUCN.org

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

- Several obstacles face the optimum enforcement of laws with the lack of required staff, resources and logistics. Human and financial resources are often not sufficient, for example the MoA cannot monitor the fisheries sector in all Lebanon and at sea.
- Initiative taken by the municipality of Tyre with local stakeholders needs further support to face existing challenges.
- Lack of environmental awareness of inspectors from other ministers like MoET and MoT
- Need to identify areas where inspectors from other ministries can support in identifying environmental violations while conducting their day to day work and provide environmental training to the inspectors.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 17.6

National Action 17.6 Provide the MoJ with all existing environmental legislation and train judges

Measure 17.6a: Coordination with Ministry of Justice

Law number 251/2014 dictates the establishment of the Environmental Public Prosecution Unit, and the appointment of full-time environmental lawyers and judges. Five environmental judges have been appointed each for a governorate, however they are not currently working exclusively on environmental matters.

Contribution to the Aichi Biodiversity Targets or National Targets

Contributes to the NT 17 and National Priority Area 12: Institutional and Legal Framework

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Measure is partially effective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

- An electronic databank does not yet exist at the MoJ.
- Biodiversity and environmental issues are not included at the Institute of Judicial Education.
- Implementation of the electronic databank project at the MoJ is on-going (carried out by OMSAR/EU).
- It is crucial that biodiversity and environmental issues should be part of the program followed at the Institute of Judicial Education to enhance knowledge and awareness on these issues.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 17.7

National Action 17.7 Integrate the biodiversity agenda in NCE to enhance coordination

No identified measures for this NA.

Contribution to the Aichi Biodiversity Targets or National Targets

-

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

NCE is not meeting regularly; it requires an active secretariat that would in turn integrate biodiversity in its agenda.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 17: By 2030, the relevant institutional and legal framework and government policies are reviewed, updated and reinforced where necessary to ensure effective biodiversity conservation and sustainable use.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☒ Progress towards target but at an insufficient rate

☐ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

Limitations related to this NT:

- There is no clear role and delegation of responsibilities and tasks defined within the institutions/ministries. There is a lack in coordination.
- It is recommended that the NBSAP be disseminated among the institutions/ministries by specifying the role and tasks of each one (responsibility).
- There is a general deficiency in quantitative data in Lebanon, which hinders the ability to properly assess and evaluate status and trends, this is primarily due to the absence of systematic monitoring due to limited resources.

Indicators used in this assessment

1- Number of environmental infractions related to the sectorial plans leading to court-cases.

2- Number of relevant laws reviewed, updated and reinforced where necessary to ensure effective biodiversity conservation and sustainable use.

3- Number of government policies reviewed, updated and reinforced where necessary to ensure effective biodiversity conservation and sustainable use.

Other tools or means used for assessing progress

Data on indicators, desk review and expert discussions assessed this progress.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☒ Based on partial evidence

☐ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

1- Number of environmental infractions related to the sectorial plans leading to court-cases.

Status: Unknown, no information available

Notes:

- It is recommended that the MoE coordinates with the MoJ to keep an updated record of these infarctions. A registry should be created to keep record on environmental infarctions related to biodiversity.

2- Number of relevant laws reviewed, updated and reinforced where necessary to ensure effective biodiversity conservation and sustainable use.

Status: 1

Notes:

- Decisions related the hunting law pertaining to the regulation of hunting which limit hunting to a specific season and for specific species only excluding endemic, rare and threatened species (Decision # 449/1 dated 1/6/2017 opening the hunting season for 2017 and defining the game birds and animals allowed for hunting during the season and defining their bag limits, Decision # 723/1 dated 28/8/2018 opening the hunting season for 2018 and defining the game birds and animals allowed for hunting during the season and defining their bag limits), Decision # 798/1 dated 10/9/2018 banning the hunting of foxes, hyenas and wolves all year long.

Other reviews are done for:

- National Strategy on PGRFA (Approved by Minister of Agriculture)
- The following draft legislation that leads to the conservation and sustainable use of biodiversity were submitted either from MoE or MoA (based on their mandate) to the CoM and Parliament:
    - Draft Protected Areas Framework Law
    - Draft Law on Access and Benefit sharing
    - Draft decree on biosafety
    - Draft law on the management of plant genetic resources for food and agriculture
    - Draft law on CZM
    - Draft updated fishing law
    - Amendment of Forest Law
    - Amendment of hunting Law

- On-going work to declare new PAs:
  - Ras Chakaa (Marine) (COM)
  - Abbassiye (Marine) (COM)
  - Donniye (Parliament)
  - Rihan (Parliament)
  - Andqet (MoE; documents completed to be sent to CoM)
  - Noumayriye (MOE; documents completed to be sent to CoM)
  - Rashaya Al Wadi (MoE; documents completed to be sent to CoM)
  - Sarada (MOE; waiting for more documents)
  - Yaroun (MOE; waiting for more documents)
  - Rashaya Al Fokhar (MOE; waiting for more documents)
  - Zebqin (MOE; waiting for more documents)
  - Ejdebrin; to be declared as a nature site; (MOE; waiting for more documents)

3- Number of government policies reviewed, updated and reinforced where necessary to ensure effective biodiversity conservation and sustainable use.

Status: Unknown, no information available

Notes:

- Some government policies are reviewed in the context of SEAs. This is particularly relevant for offshore oil and gas environmental policies as well as the draft Law for onshore Exploration and Production of hydrocarbons which has strong provisions for the protection of biodiversity.

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

NA

Relevant websites, web links and files

-

NATIONAL TARGET 18

Section I - Information on the targets being pursued at the national level

National Target

Target 18: By 2030, Lebanon has developed and is implementing a robust resource mobilization strategy with a sustainable mechanism to finance biodiversity initiatives.

Rationale

Limited budgets and funds for the MoE and MoA exist which restrict mobilization efforts. Additional efforts need to be realized to ensure the success of biodiversity programs and projects.

Level of Application

☐ Regional/multilateral – please indicate area concerned

☒ National

☐ Subnational – please indicate area concerned

Relevance of the National Target to Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☒ 20

Relevance to other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Contributes to the National Priority Area 13: Resource Mobilization.

Relevant websites, web links and files

-

Section II - Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

National Target

Target 18: By 2030, Lebanon has developed and is implementing a robust resource mobilization strategy with a sustainable mechanism to finance biodiversity initiatives.

National Actions

National Actions for National Target 18:

National Action 18.1 Adopt the Decree on the National Environmental Fund and prioritize biodiversity for funding

National Action 18.2 Study innovative sources of financing for biodiversity

National Action 18.3 Engage donors in the implementation of the strategy

National Action 18.4 Engage the private sector in resource mobilization

National Action 18.5 Conduct an environmental valuation study to promote the mobilization of internal resources

National Action 18.6 Explore opportunities for technical assistance

National Action 18.7 Introduce biodiversity valuation in SEAs and EIAs to assess the economic value and potential loss resulting from the assessed project's impacts

National Action 18.8 Develop a national framework enabling proper evaluation of the economics of ecosystems and biodiversity (TEEB, BIOFIN) in Lebanon. This can include payments for ecosystem services, reforming environmentally harmful subsidies or introducing fiscal incentives for conservation

National Action 18.9 Conduct awareness campaigns and educational seminars to introduce the concept of biodiversity valuation and its importance to decision makers and concerned stakeholders (public sector, private sector, research institutions, NGOs, etc.)

National Action 18.10 Conduct economic valuation studies for all nature reserves and make use of it in decision making, seeking internal and external funding, and ecotourism promotion

Measures Taken to contribute to the implementation of NA18.1

National Action 18.1 Adopt the Decree on the National Environmental Fund and prioritize biodiversity for funding

There is **one** main measure that contributes to the implementation of the NA18.1.

Measure 18.1a: Prioritize Biodiversity in the NEF

- NEF has not yet been established although a draft decree is available for enactment by the Council of Ministers

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 18 and National Priority Area 13.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☒Unknown

Tools and Methodology for assessment of effectiveness

The National Environmental Fund has not been established yet. Effectiveness cannot be established in the absence of the NEF.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Political resistance to establish yet another fund and dedicated to environment.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 18.2

National Action 18.2 Study innovative sources of financing for biodiversity

No measures identified yet.

Contribution to the Aichi Biodiversity Targets or National Targets

-

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Lack of experience in Lebanon in identifying and using innovative sources of financing. Need to identify means on how to use climate financing opportunities for biodiversity conservation. It is recommended to

search for innovative sources of funding for biodiversity such as environmental taxes on buildings, dams, hotels, quarries, etc.

This funding should be directly mobilized to benefit research and actions on biodiversity and its conservation.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 18.3

National Action 18.3 Engage donors in the implementation of the strategy

There is **one** main measure that contributes to the implementation of the NA18.3.

Measure 18.3a: Donors engagement in implementation

Donors are usually engaged in the implementation of projects they fund. For instance, the national targets of Lebanon's NBSAP, have been adopted by the Critical Ecosystem Partnership Fund (CEPF) in their calls for funding for Lebanon. Mava foundation has also been very active in supporting biodiversity conservation initiatives.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 18 and National Priority Area 13.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Certain donors are known to be supporting biodiversity conservation. However, such support is not done in a coordinated manner under the umbrella of NBSAP implementation. The measure has been partially effective so far.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Need to establish a donor coordination platform for the implementation of the NBSAP

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 18.4

National Action 18.4 Engage the private sector in resource mobilization

There is **one** main measure that contributes to the implementation of the NA18.4.

Measure 18.4a: Engage the private sector

- Decree 167/2017 on tax deductions based on environmental incentives provides an opportunity for private sector engagement. Implementation of the decree is however still pending signature by the Minister of Finance of a pending administrative decision.
- Diane Foundation
- Environmental Funds from Banks such as Green Loan by Banque Libano-Française, IBL Bank, FNB Bank,
- CRDP

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 18 and National Priority Area 13.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Decree 167/2017 provides the regulatory framework to give incentives for the private sector to invest in biodiversity conservation however the incentive mechanism is not applicable yet. Resource mobilization at the moment relies on private incentives and therefore this measure is partially effective.

Relevant websites, web links and files

- https://www.eblf.com/en/GreenLoan
- https://www.ibl.com.lb/english/personal-banking/loans/green-loans
- https://www.fnb.com.lb/Products-and-Services/Loans/Pages/green-loans-Lebanon.aspx

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Need to widen outreach to the private sector to become familiar with the opportunities provided by Decree 167/2017

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 18.5

National Action 18.5 Conduct an environmental valuation study to promote the mobilization of internal resources

No measures identified yet.

Contribution to the Aichi Biodiversity Targets or National Targets

-

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

No valuation study has been conducted at national level as of yet to become a means to convince policy makers and the Ministry of Finance to mobilize national budget resources to NBSAP implementing ministries such as MoE and MoA.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Such national valuation studies are complex as well as time and money demanding; technical support from international donors would be instrumental to implement this National Action.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 18.6

National Action 18.6 Explore opportunities for technical assistance
There is **one** main measure that contributes to the implementation of the NA18.6.

Measure 18.6a: Technical assistance opportunities

- The EU has recently closed a technical assistance project to strengthen the institutional capacities of the Ministry of Environment (Streg);
- In 2016, the Ministry of Environment has started to implement the project, "Towards deep-sea conservation in Lebanon", in collaboration with Oceana, SPA/RAC, IUCN and the Lebanese National Centre for Marine Research, and with funds from MAVA; within this project, Oceana, SPA/RAC, IUCN and the Lebanese National Centre for Marine Research, have concluded Between 3 and 28 October 2016, an expedition in four deep-sea previously unstudied areas of Lebanon: Jounieh- Saint Georges canyon, Beirut(Ouzai) canyon; Sayniq (Saida)canyon, and Chekka – Batroun canyon. Among those four sites and in collaboration with the Ministry of Environment, IUCN prepared a draft law for the declaration of Jounieh as a marine deep sea nature reserve and SPA/RAC prepared the management plan of this proposed site (both were prepared in 2018);
- Ecological characterization through biodiversity field surveys were done in 2016 by SPA/RAC in collaboration with the Ministry of Environment in three of the proposed coastal MPAs of Lebanon: Batroun, Jbeil and Madfoun, through the EU-funded MedMPAnet regional project executed by SPA/RAC at the regional level. The field surveys were carried out by a mixed team of national and international experts from the National Centre for Marine Sciences of Lebanon, the University of Alicante, Spain, SPA/RAC and IUCN.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 18 and National Priority Area 13.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Lebanese institutions are familiar with technical assistance programmes. Some TAs have been implemented in the environmental management field; future TAs could target also implementation of the NBSAP. The measure is considered as partially effective.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Need to identify bilateral and multilateral donors that provide technical assistance as a means of cooperation.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 18.7

National Action 18.7 Introduce biodiversity valuation in SEAs and EIAs to assess the economic value and potential loss resulting from the assessed project's impacts

There is **one** main measure that contributes to the implementation of the NA18.7.

Measure 18.7a: Valuation in SEAs and EIAs

Biodiversity valuation is not a requirement in EIAs but may be requested as part of the review process, particularly in projects that have a high impact on biodiversity, projects located in biodiversity hotspots, or projects with a very large environmental impact.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 18 and National Priority Area 13.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☒Unknown

Tools and Methodology for assessment of effectiveness

Such valuations are not being conducted in Lebanon.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Budgets of SEAs and EIAs are often limited and their duration is not sufficient to allow such economic valuations to be conducted; there is also limited technical capacity in Lebanon.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 18.8

National Action 18.8 Develop a national framework enabling proper evaluation of the economics of ecosystems and biodiversity (TEEB, BIOFIN) in Lebanon. This can include payments for ecosystem services, reforming environmentally harmful subsidies or introducing fiscal incentives for conservation

There is **one** main measure that contributes to the implementation of the NA18.8.

Measure 18.8a: A national framework

- Fiscal incentives have been introduced via Decree 167/2017.

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 18 and National Priority Area 13.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☒Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

Decree 167/2017 is still not in application due to the lack of an administrative procedure for its implementation (pending issuance of a Ministerial Decision from the Minister of Finance). Other efforts towards this action are inexistent.

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

There is limited capacity in Lebanon to evaluate the economics of ecosystems and design financial instruments accordingly; this is a good area for technical assistance.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 18.9

National Action 18.9 Conduct awareness campaigns and educational seminars to introduce the concept of biodiversity valuation and its importance to decision makers and concerned stakeholders (public sector, private sector, research institutions, NGOs, etc.)

No measures identified yet.

Contribution to the Aichi Biodiversity Targets or National Targets

-

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☐Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

-

Relevant websites, web links and files

-

Other Relevant Information

-

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Lack of resources (technical and financial) to conduct such awareness campaigns.

Relevant websites, web links and files

-

Measures Taken to contribute to the implementation of NA 18.10

National Action 18.10 Conduct economic valuation studies for all nature reserves and make use of it in decision making, seeking internal and external funding, and ecotourism promotion

There is **one** main measure that contributes to the implementation of the NA18.10.

Measure 18.10a: Economic valuation of nature reserves

- A study on the economic value of the Shouf Biosphere Reserve (2015)
- A study on the economic value of Wadi El Hujeir Reserve (2017-2018)

Contribution to the Aichi Biodiversity Targets or National Targets

This measure contributes to National Target 18 and National Priority Area 13.

Effectiveness of the implementation measure taken in achieving desired outcomes

☐Measure taken has been effective

☒Measure taken has been partially effective

☐Measure taken has been ineffective

☐Unknown

Tools and Methodology for assessment of effectiveness

The experience of the Shouf Biosphere Reserve is a success story that should be replicated in other nature reserves in Lebanon. The measure is considered to be partially effective pending its implementation in other reserves.

Relevant websites, web links and files

-

Other Relevant Information

The Appointed Protected Area Committee (APAC) of the Palm Islands Nature Reserve (PINR) usually opens the reserve for the public regular visitation extending from the beginning of July to the end of September based on Law number 121/92. In 2016 and under the project "Legal and technical support for developing ecotourism" funded by the MEDPAN for the benefit of the Palm Island Nature Reserve (PINR) in partnership with the IOE-UOB, legal procedures/guidelines for "tour operators", "tour guides" and "scuba diving clubs" to visit the PINR beyond the regular "Open Season" were developed. Several theoretical and practical trainings were developed and needed materials were distributed to related stakeholders. At the same time decisions were based on a carrying capacity study of the PINR avoiding additional pressure to the fragile habitat.

Relevant websites, web links and files

-

Obstacles and Scientific and Technical Needs related to the measure taken

Training in innovative financing resource mobilization.

Relevant websites, web links and files

-

Section III - Assessment of progress towards each national target

National Target

Target 18: By 2030, Lebanon has developed and is implementing a robust resource mobilization strategy with a sustainable mechanism to finance biodiversity initiatives.

Progress towards the implementation of the selected target

☐ On track to exceed target

☐ On track to achieve target

☐ Progress towards target but at an insufficient rate

☒ No significant change

☐ Moving away from target

☐ Unknown

Date the assessment was done

December 2018.

Additional information

In Lebanon, there is a need for more coordination among ministries and private sector. There is a lack of proper mainstreaming of biodiversity issues.

Indicators used in this assessment

1- MoE budget dedicated to NBSAP
2- Budget of other ministries for the implementation of the NBSAP (eg MoA)
3- Municipal budgets related to biodiversity conservation and sustainable use
4- Budget allocated to the NEF and to the NBSAP
5- Financial contributions from international sources for the implementation of the NBSAP (including climate financing)
6- Financing of biodiversity initiatives by the private sector
7- Percent increase in financial resources for biodiversity initiatives from 2015 baseline

Other tools or means used for assessing progress

Based on data collected on indicators and supported by expert opinion.

Relevant websites, web links and files

-

Level of confidence of the assessment

☐ Based on comprehensive evidence

☐ Based on partial evidence

☒ Based on limited evidence

Explanation for the level of confidence indicated

The methodology followed for the evaluation of level of confidence of the assessment of the progress towards the NT is highly related to the measures taken for the implementation of the NAs and to the indicators used. Whereby:

- If data exists for the indicators, then the assessment of the progress would be based on
- comprehensive evidence;
- If data exists for some of the indicators, then the assessment of the progress would be based on partial evidence; and
- If no data exists for the indicators, then the assessment of the progress would be based on limited evidence.

1- MoE budget dedicated to NBSAP.

Status: 919,830 USD/year

Notes:

- MoE dedicates annual budget for the management of the nature reserves that have committees (8 reserves)
- Potential Additional revenues (but which go to the central treasury) come from hunting: 100,000 LL per bird permit (16108 in 2017) and 150,000 LL per animal permit (4 in 2017).

2- Budget of other ministries for the implementation of the NBSAP.

Status: Unknown, no available information

Notes:

- No direct budget has been specifically dedicated to NBSAP yet.
- The MoA has however budget lines for reforestation that supports the NBSAP.
- CERD has a specific budget to integrate biodiversity into the curriculum.
- MEHE receives donations to implement extracurricular activities of which capacity-building programs related to biodiversity were organized to the health and environmental educators in public schools.

3- Municipal budgets related to biodiversity conservation and sustainable use.

Status: No information

Notes: -

4- Budget allocated to the NEF and to the NBSAP.

Status: 0

Notes:

The National Environment Fund has not been implemented. No budget has been allocated to the NEF and the NBSAP yet.

5- Financial contributions from international sources for the implementation of the NBSAP.

Status: Various contributions from donors, of which for activities related to the NBSAP.

Notes: -

6- Financing of biodiversity initiatives by the private sector.

Status: No information

Notes:

There are private initiatives such as Jabal Moussa Nature Reserve which is partly financed by private individuals, other initiatives exist but their value is unknown.

7- Percent increase in financial resources for biodiversity initiatives from 2015 baseline.

Status: No information

Notes: -

Adequacy of monitoring information to support assessment

☐ Monitoring related to this target is adequate

☐ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

☒ No monitoring system in place

☐ Monitoring is not needed

Target monitoring

-

Relevant websites, web links and files

-

PART 2: LEBANON'S CONTRIBUTION TO GLOBAL TARGETS AND GOALS AND UPDATED COUNTRY PROFILE

Section IV - Description of national contribution to the achievement of each global Aichi Biodiversity Target

Lebanon's National Targets were based on the ABTs as indicated in the NBSAP updated in 2016. As such, the assessment of Lebanon's contribution to the ABTs will be based on the Lebanon's progress and work being done to the achievement of the NTs. Findings and assessments carried out in Sections II and III will be used in this Section.

ABTs	ABT 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably

Description of extent of contribution to the achievement of the ABTs

This ABT is Linked to Lebanon's **NT 12:** By 2030, 100% of school and university students and at least 60% of the public are aware of the importance of biodiversity, its values, and the need for its conservation and sustainable use.

Lebanon is on its way to achieve this NT, as described in Section III. Awareness initiatives are primarily targeting students in public schools, and reliant on private initiatives for private schools and universities, and the public such as the MoE/UNDP awareness campaign that targeted municipalities as elaborated in Section II. MoE efforts on biodiversity awareness and capacity building are focused on the hunting law and it targets ISF and forest guards of the MoA and the nature reserves' rangers.

In the nature reserves, biodiversity awareness campaigns are continuously being carried out, targeting the general public and in particular schools' students.

Google Trends does not provide the actual search numbers, however it shows the normalized level of interest overt the year 2018 on biodiversity issues (Figure 20) as well as the districts were most popular searches were made (Figure 21).

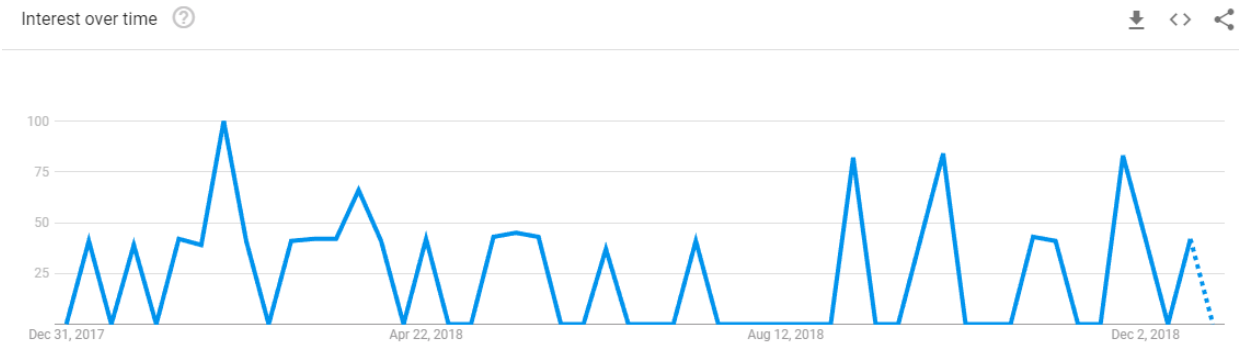


Figure-20 Biodiversity Research on Google Search Engine

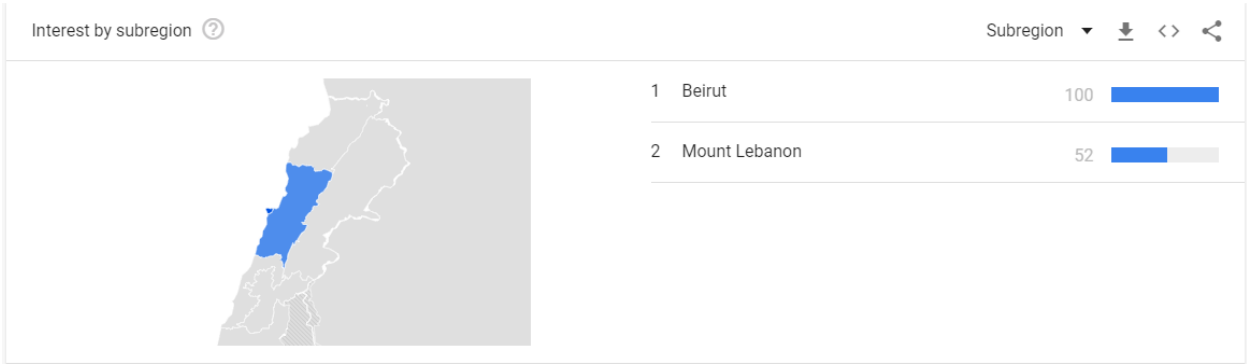
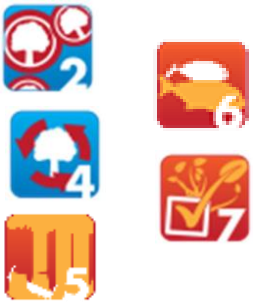


Figure-21 Interest in Biodiversity Topic by Subregion

Overall, although there is a lack of quantitative information on the indicators for this NT, expert opinion on the subject matter and local knowledge indicate that there is a general increase in awareness levels.

Relevant websites, web links and files

https://trends.google.ca/trends/explore?q=Biodiversity&geo=LB

ABTs	
	**ABT 2:** By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems. **ABT 4:** By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits. **ABT 5:** By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced. **ABT 6:** By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits. **ABT 7:** By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Description of extent of contribution to the achievement of the ABTs

These ABTs are linked to Lebanon's Priority Areas on Sustainable Management and Use of Natural Ecosystems and Resources and Mainstreaming Biodiversity into National and Sub-national Policies, Plans and Programs:

NT 6: By 2030, 50% of all-natural ecosystems are sustainably managed and properly considered in spatial planning implementation.

NT 7: By 2030, the gap between Lebanon's ecological footprint and bio-capacity is alleviated to reach an equal state.

NT 8: By 2030, the private sector has taken steps to implement plans for sustainable production and consumption to mitigate or prevent negative impacts on ecosystem from the use of natural resources.

NT 13: By 2030, government entities mainstream biodiversity priorities (conservation, benefits sharing, pressure alleviation, sustainable management, sustainable use of natural resources) into their policy making processes and their implementation.

Progress towards the implementation of the above NTs in Lebanon is lacking, assessment towards the NTs, as elaborated in Section III, explains that progress towards the targets is at an insufficient rate, and at this level, the targets will not be met.

Sustainable management initiatives exist in Lebanon; however, it is not known to what degree and what is their influence. There is a deficiency in quantitative data in Lebanon, which hinders the ability to properly assess and evaluate status and trends, this is primarily due to the absence of systematic monitoring due to limited resources.

NT 8 encourages sustainable production and consumption, thus contributes to the achievement of ABT 4, through regulating all activities from classified industrial establishments that may cause harmful pollution and environmental degradation, as per Decree 8471/2012. In addition, Decision 189/2016 requires industrial establishments to incorporate in their environmental audits sustainable consumption and production opportunities within their compliance action plan, in order to be given an investment permit.

There is a lack of quantitative information and data on footprint and biocapacity in Lebanon (NT7) as such progress towards this NT is unknown.

As for ABT 2 and NT 13 on mainstreaming biodiversity priorities and integration into policies, there is limited coordination between government entities, and no full implementation of main environmental strategies and policies such as NBSAP by the other sectors.

This is mostly due to the limited human resources at MoE to raise awareness of public institutions and stakeholders on SEA/EIA as well as effective integration of biodiversity considerations in these assessments and to the fact that civil servant hiring faces administrative/legal constraints due to the slow institutional procedures and bureaucracy that delays implementation.

ABTs 	**ABT 3:** By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.

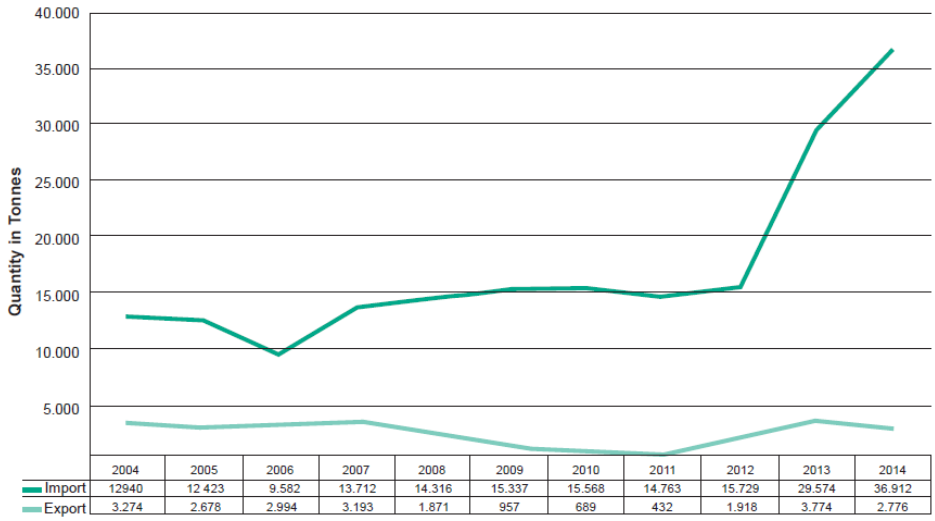
Description of extent of contribution to the achievement of the ABTs

No NT is directly linked to this ABT.

ABTs 	**ABT 8:** By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity

Description of extent of contribution to the achievement of the ABTs

No NT is directly linked to this ABT, however Lebanon signed the Stockholm Convention on Persistent Organic Pollutants in 2001, which aims to reduce and eventually eliminate POPs emissions and products from operation activities. In that regard, the MoE published in 2017 a review and update of the National Implementation Plan for the Stockholm Convention on POPs, in which an analysis of the pesticides import and export trend has been conducted as shown in Figure 22. Additionally, potential POPs pesticides contaminated sites are shown in Figure 23.



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Import	12940	12 423	9.582	13.712	14.316	15.337	15.568	14.763	15.729	29.574	36.912
Export	3.274	2.678	2.994	3.193	1.871	957	689	432	1.918	3.774	2.776

Figure-22 Imported and Exported Pesticides in Lebanon between 2004 and 2014

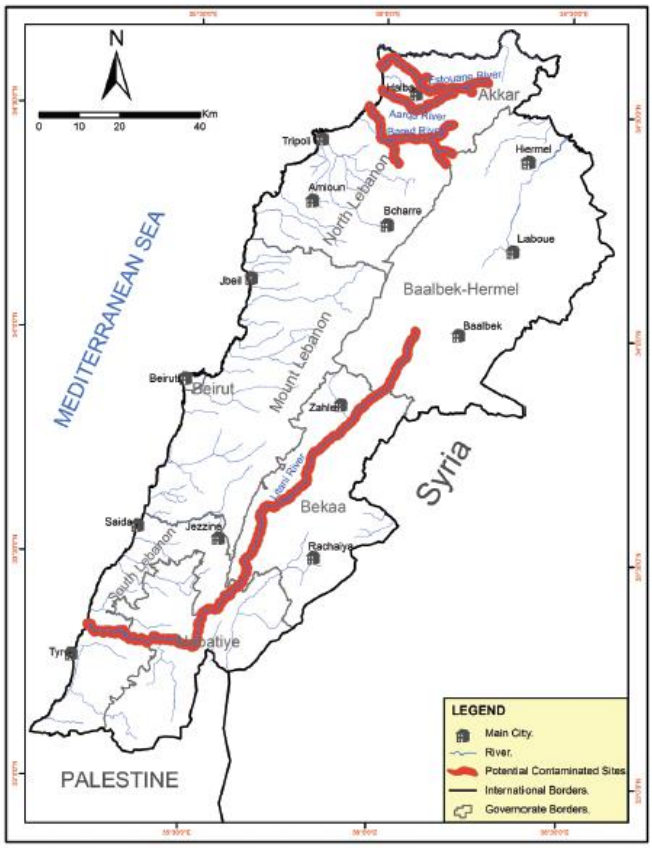


Figure-23 Potential POPs Pesticides Contaminated Sites

Source: GEF/UNEP/MoE/ELARD, 2016[1]

[1] GEF/UNEP/MoE/ELARD, 2016. Review and update of the National Implementation Plan for Stockholm Convention on Persistent Organic Pollutants (POPs) in Lebanon.

Moreover, Lebanon ratified Minamata Convention on mercury in 2017 in an effort to protect the human health and the environment form anthropogenic emissions and releases of mercury and mercury compounds.

ABTs 	**ABT 9:** By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Description of extent of contribution to the achievement of the ABTs

This ABT is Linked to Lebanon's **NT 11:** By 2030, effective measures are in place to control the introduction and diffusion of IAS into the environment.

A national monitoring programme for marine biodiversity in Lebanon was prepared in 2017 by SPA/RAC in close collaboration with the Ministry of Environment and it included a national monitoring programme for marine non-indigenous species (NIS), among other key marine species, and a National Action Plan on marine species introductions and invasive species in Lebanon was developed in 2018 by SPA/RAC in collaboration with MoE.

Furthermore, factsheets for the most significant marine invasive alien species in Lebanon, and a protocol for invasive alien species monitoring in the marine environment of Lebanon, in addition to recommendations for legal measures on IAS prevention and control to be taken by the concerned national authorities, were developed in December 2018, through a joint project executed by the Ministry of Environment, IUCN, UN Environment with GEF funds.

As such, actions taken are contributing to the control and diffusion of IAS in the Lebanese environment. However, a national official inventory on IAS still does not exist. There is progress towards the achievement of this NT, and thus there is some contribution from Lebanon to the achievement of this ABT.

ABTs 	**ABT 10:** By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Description of extent of contribution to the achievement of the ABTs

No NT is directly linked to this ABT.

ABTs 	**ABT 11:** By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.

Description of extent of contribution to the achievement of the ABTs

This ABT is Linked to Lebanon's:

NT 4: By 2030, at least 20% of natural terrestrial and marine ecosystems are protected and all types of ecosystems are represented in the PA network.

NT 5: By 2030, the total percent coverage of nature reserves is increased to reach at least 5% of Lebanon's area.

Ca. 2.4% of the area of Lebanon is covered by nature reserves, to which we should account for additional protected forests as per law 558/1996, nature sites under the protection of MoE, Himas, and biosphere reserves.

Work is ongoing in terms of characterizing natural and semi-natural ecosystems, ecosystems classification, identifying areas of high biodiversity value and establishing new protected areas. The Lebanese MoE is in the process of identifying priority areas for conservation and declaring new protected areas as elaborated in Section II. Identified Key Biodiversity Areas (KBAs) are shown in Figure 6 in NT4.

Management plans exist for 7 PAs in Lebanon, these include: the Shouf Biosphere Reserve and Jabal Moussa Biosphere Reserve, Tannourine, Ehden and Bentael, TCNR, PINR , in addition to two proposed MPAs:Ras Chekka (coastal MPA), and Jounieh (Deep Sea MPA)

Overall, the total percent coverage of nature reserves will increase to reach at least 5% of Lebanon's area and this contributes to ABT 11.

ABTs 	**ABT 12:** By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Description of extent of contribution to the achievement of the ABTs

This ABT is Linked to Lebanon's Priority Area on Threatened Species and **NT 1:** By 2030, the status of 75% of known flora and fauna species is identified and conservation actions are implemented on 50% of threatened species. Progress towards the achievement of this NT is happening but at an insufficient rate.

To-date there is no national red list in Lebanon which hinders the implementation of measures proposed to conserve threatened species. However, several national red lists are in preparation and some will be published in 2019 (birds, endemic plants, etc.). Threatened species richness map was developed using the UN Biodiversity Lab mapping tool and is shown in Figure 5 in NT1.

Efforts to monitor some animal and plant species and to re-introduce locally extinct taxa (Nubian Ibex) are being undertaken. Seeds of several endemic and economically plant species are being conserved in seed banks.

ABTs 	**ABT 13:** By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Description of extent of contribution to the achievement of the ABTs

This ABT is Linked to Lebanon's Priority Area on Genetic Diversity and to NTs:

NT 2: By 2030, the genetic diversity of 50% of important native fauna and flora is conserved in-situ and ex-situ.

NT 3: By 2030, the implementation mechanism of the Cartagena Protocol on Biosafety is operational.

Progress towards the achievement of NT2 is occurring but at an insufficient rate. Though many endemic plant species, economically important plant species and wild relatives of crops are conserved ex-situ at national and international seed banks, most national legislation that ensures the conservation of this species is still in draft form.

Apart from plant species in nature reserves, UNESCO Man and Biosphere reserves and seed banks whose genetic diversity or part thereof is conserved in situ, tangible action ensuring the conservation of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species is still needed.

As for NT3, no progress has been made since the draft decree on "National Measures on Biosafety" has not been approved by the CoM yet, though it is in the final stages.

ABTs	
	**ABT 14:** By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Description of extent of contribution to the achievement of the ABTs

This ABT is linked to Lebanon's Priority Area on Ecosystem Restoration and **NT 9:** By 2030, rehabilitation plans are implemented in at least 20% of degraded sites so that they can safeguard the sustained delivery of ecosystem services. Progress towards the achievement of this NT is occurring but at an insufficient rate.

In Lebanon, land degradation assessment was undertaken but a national inventory of degraded sites by type and location is still needed and should be regularly updated. Technical guidelines for rehabilitation of certain type of degraded sites exist to a certain extent in Lebanon. More importantly, master plans for rehabilitation of degraded sites do exist:

- National management guidelines for forest and rangeland restoration will be developed in the context of the SLMQ project.
- Restoration efforts, aiming at restoring terraces, pastoral lands, croplands, orchards, are being undertaken at the Shouf Biosphere Reserve (Funded by MAVA foundation and implemented by the reserve, ACS, and SPNL).
- Rehabilitation of dumpsites based on the Updated Master Plan for the Closure and Rehabilitation of Uncontrolled Dumpsites throughout the Country of Lebanon carried out in 2016 with assigned costing and rehabilitation options.
- Rehabilitation plans have been developed for several quarries.
- Reforestation and rehabilitation of degraded forest areas are being done by various public and private initiatives.

Although some rehabilitation works were carried out and priority rehabilitation systems have been put in place, however, not all degraded sites have been identified at the national level. Existing studies are more specific and focus on one type of sites. Some of the funding acquired are specific to geographical areas or targeted communities and do not always follow priority sites.

ABTs	
	**ABT 15:** By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Description of extent of contribution to the achievement of the ABTs

No NT is directly linked to this ABT.

ABTs	
	**ABT 16:** By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Description of extent of contribution to the achievement of the ABTs

This ABT is Linked to Lebanon's **NT 10:** By 2030, the national Law on access and benefit sharing is endorsed, operational, and enforced.

The Government of Lebanon ratified the Nagoya Protocol through Law # 3 dated Feb. 3, 2017. The national draft Law on Access to Lebanese biological and genetic resources and sharing of the benefits arising from their utilization was submitted to the Council of Ministers and is currently under review. As such this NT is in on track to achieve this NT. Although Lebanon does not meet ABT 16 in its set timeframe at 2015 but it will be met in the near future.

ABTs	
	**ABT 17:** By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan

Description of extent of contribution to the achievement of the ABTs

No NT is directly linked to this ABT, however efforts have been made to integrate the NBSAP into the public sectoral policies and programmes (e.g. Update for the SEA for exploration and production activities offshore Lebanon, and SEA for the provision of services for the development of local level master plans and detailed urban plans in Qaraoun catchment).

ABTs	
 	**ABT 18:** By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels. **ABT 19:** By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Description of extent of contribution to the achievement of the ABTs

This ABT is linked to Lebanon's Priority Area on Research and Knowledge Transfer and Nts:

NT 15 By 2030, research on biodiversity is improved in Lebanon, and research outputs and biodiversity related reports are shared through a centralized platform (from both public and private institutions), which is updated and made accessible to the public (CHM).

NT 16 By 2030, traditional knowledge uses, and practices of local communities relevant to biodiversity and sustainable use of resources are documented, preserved, and shared/published.

There is a general increase in the number of publications research related to biodiversity, However, this cannot be quantified as there is a general deficiency in quantitative data in Lebanon, which hinders the ability to properly assess and evaluate status and trends, this is primarily due to the absence of systematic monitoring due to limited resources.

Regarding the national CHM, work is on-going to update its content and data, and it is planned to initiate in 2019 the operation of the interactive portal with the different contributors from the various concerned institutions in Lebanon.

As such, it was assessed that Lebanon is on its way to achieve NT 15 while progress towards NT 16 is unknown due to the lack of quantitative data.

ABTs	
	**ABT 20:** By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

Description of extent of contribution to the achievement of the ABTs

This ABT is Linked to Lebanon's **NT 18:** By 2030, Lebanon has developed and is implementing a robust resource mobilization strategy with a sustainable mechanism to finance biodiversity initiatives.

In Lebanon, there is a need for more coordination among ministries and private sector. There is a lack of proper mainstreaming of biodiversity issues and this was mostly witnessed during discussions held with various stakeholders during the thematic meeting sessions carried out for the purpose of the 6NR, some representatives from concerned ministries were not aware of the NBSAP and Lebanon's commitment for biodiversity conservation and priority issues.

At the moment, Lebanon's progress towards the achievement of NT 18 of no significant change. However, MoE and biodiversity community in Lebanon is hoping to raise more awareness on this issue and utilize the 6NR as a tool to shed light on gaps and bring more attention to the NBSAP and its implementation.

Based on the description of Lebanon's contributions to the achievement of the ABTs, how and to what extent these contributions support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals

Lebanon has taken major footsteps towards the implementation of the 2030 Agenda for Sustainable Development, through its contribution to the achievement of the ABTs. This emphasizes Lebanon's commitment in tackling issues related to poverty, health, education, growth, inequality, environment protection, governance, and women's empowerment.

The 2030 Agenda comprises 17 Sustainable Development Goals (SDGs). When achieved, they would contribute to the stability and social welfare of the country. These SDGs are linked to the following ABTs:

SDGs		ABTs linked
SDG 1: No poverty		ABT 2, ABT 6, ABT 7, ABT 14
SDG 2: Zero hunger		ABT 6, ABT 7, ABT 13, ABT 18
SDG 3: Good health and well-being		ABT 8, ABT 13, ABT 14, ABT 16, ABT 18
SDG 4: Quality education		ABT 1, ABT 4, ABT 19
SDG 5: Gender equality		ABT 14, ABT 17, ABT 18
SDG 6: Clean water and sanitation		ABT 8, ABT 11, ABT 14, ABT 15
SDG 7: Affordable and clean energy		ABT 5, ABT 7, ABT 14, ABT 19
SDG 8: Decent work and economic growth		ABT 2. ABT 4, ABT 6, ABT 7, ABT 14, ABT 16
SDG 9: Industry, innovation and infrastructure		ABT 2, ABT 4, ABT 8, ABT 14, ABT 15, ABT 19
SDG 10: Reduced inequalities		ABT 8, ABT 15, ABT 18, ABT 20
SDG 11: Sustainable cities and communities		ABT 2, ABT 4, ABT 8, ABT 11, ABT 15

SDGs		ABTs linked
SDG 12: Responsible consumption and production		ABT 1, ABT 6, ABT 7, ABT 8, ABT 19
SDG 13: Climate action		ABT 5, ABT 10, ABT 14, ABT 15
SDG 14: Life below water		ABT 2, ABT 3, ABT 4, ABT 5, ABT 6, ABT 7, ABT 8, ABT 10, ABT 11, ABT 12, ABT 14, ABT 15, ABT 17, ABT 19
SDG 15: Life in land		ABT 2, ABT 4, ABT 5, ABT 6, ABT 7, ABT 9, ABT 11, ABT 12, ABT 14, ABT 15, ABT 16
SDG 16: Peace and justice strong institutions		ABT 17
SDG 17: Partnerships for the goals		ABT 2, ABT 17, ABT 19, ABT 20

Through its implementation of the NBSAP, Lebanon has tackled several goals, and these are mostly in line with SDGs 1, 3, 4, 7, 9, 11, 12, 13, 14, and 15.

Great progress has been achieved towards the completion of SDG 4 (quality education) through strengthening knowledge on biodiversity and its conservation within scholastic curriculums, and raising awareness by organizing numerous exhibitions, capacity building and awareness campaigns,

Efforts have been made to support sustainable management practices in Lebanon. Recently, progress has been made, which is critical for the achievement of several SDGs, mainly SDG 7 (affordable and clean energy), SDG 12 (responsible consumption and production), SDG 9 (Industry, innovation and infrastructure), and SDG 13 (climate action). Such practices have been endorsed by offering several incentives to the private sector which include:

- Providing tax reductions for environmental initiatives;
- Launching green bank initiatives; and
- Establishing green loans by Banque du Liban with the technical support of the Lebanese Center for Energy Conservation (LCEC) for initiatives promoting energy efficiency, renewable energy and green buildings.

SDG 1 (no poverty) and SDG 3 (good health and well-being) are also linked to the shift from an energy intensive country towards a more energy sustainable country.
In an attempt to mitigate the unsustainable urban growth, several initiatives were launched to restore terrestrial ecosystems and protect them from further deforestation. Additionally, protection measures are being taken to conserve marine areas and coastal zones. These measures support several SDGs including SDG 11 (sustainable cities and communities), SDG 15 (life on land), SDG 14 (life below water), SDG 13 (climate action) and SDG 3 (good health and well-being).

Furthermore, the conservation of threatened species is being tackled with more urgency through the preparation of several national red lists, of which some are expected to be published in 2019. This will help protect Lebanon's biodiversity and preserve life below water and on land, which refers to SDGs 14 and 15.

However, insufficient coordination between government organizational entities hinders the implementation of the 2030 Agenda for Sustainable Development, and thus Lebanon still has a long way to tackle sustainable development challenges. Hereby, government organizations along with the private sector

should work in coherence to define key aspects that could facilitate the implementation of the SDGs and encourage further engagement in development planning.

Section V - Updated biodiversity country profile

Status and trends of biodiversity, including benefits from biodiversity and ecosystem services and functions

With its Mediterranean climate, Lebanon is provided with a wealth of habitats (e.g. coastal lands, rivers, mountains with the highest peak in the Eastern Mediterranean at an elevation of 3,088 metres above sea level, etc.). The country notably boasts one of the highest densities of floral diversity in the Mediterranean basin which is one of the most biologically-diverse regions in the world.

Lebanon occupies only 0.007 % of the world's land surface area and is home to 1.11% of the world's plant species and 2.63% of reptile, bird and mammal species. Its sea is home to about 1,790 species, representing almost 2.7% of the world's marine species.

The country counts about 2,600 terrestrial plant species of which around 3.5% are strictly endemic to Lebanon. It hosts tree species with critical biogeographical locations (southernmost limit) on the western slopes of Mount Lebanon's mountain range: *Cedrus libani* A. Rich. in the Shouf Biosphere Reserve; *Abies cilicica* Boiss. in the Horsh Ehden Nature Reserve; *Ostrya carpinifolia* Scop. in Jabal Moussa Biosphere Reserve. Similarly, the vegetation of Lebanon has an exceptionally high species/area ratio (0.25 species/km^2), compared with other countries with a Mediterranean Climate such as South Africa (0.0081 species/km^2). A notable patrimonial and flagship plant species in the country is the Cedar of Lebanon (*C. libani*) that has been exploited since the rise of civilization in the Fertile Crescent. Lebanon is also located within an area of mega-diversity in terms of important agricultural food crops, wild relatives and pasture species (e.g. wheat, barley, lentils, lathyrus, vetch, medics, clover, almonds, plums, pears, pistachio, onions, garlic).

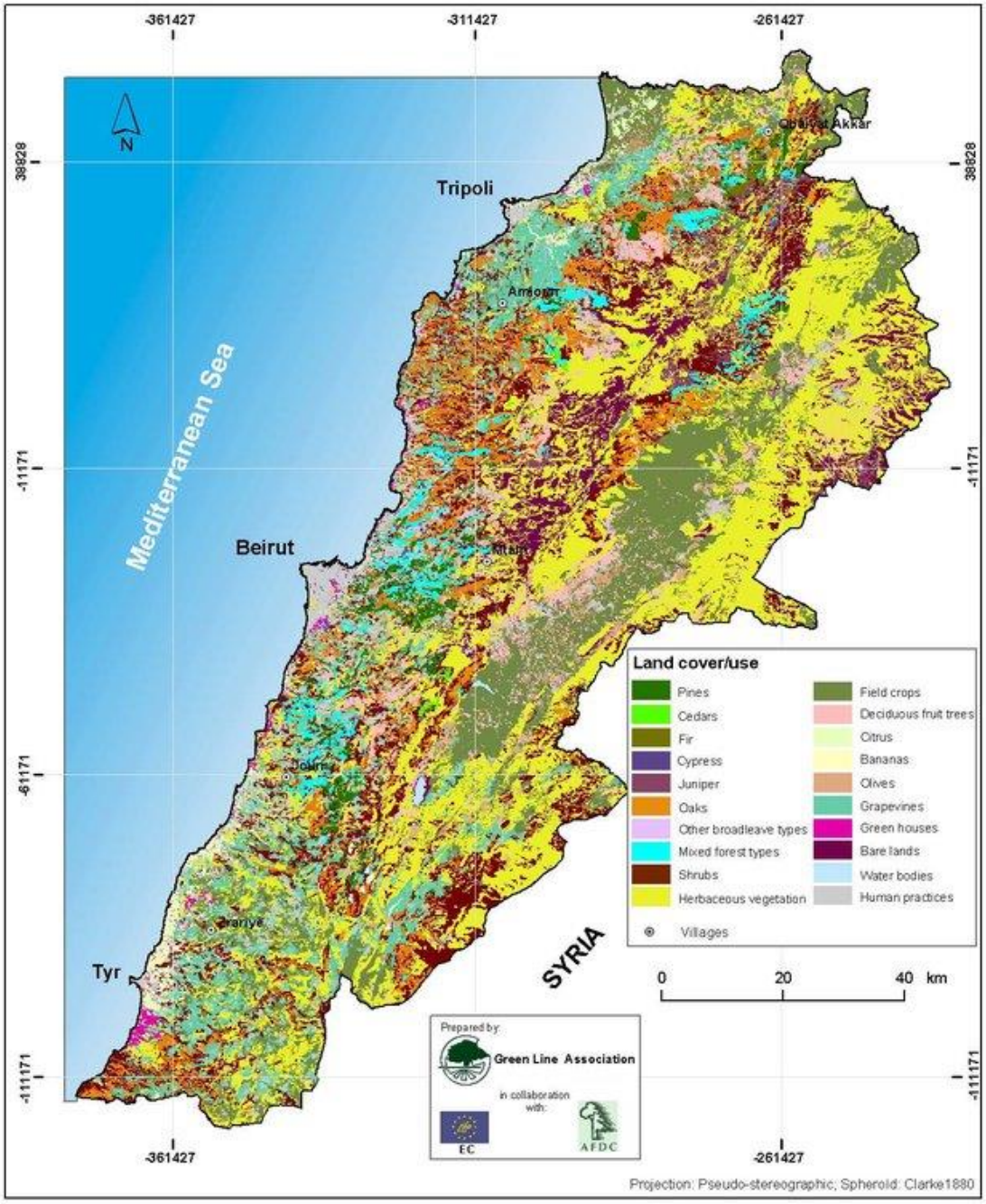


Figure 24 Land Use Map

Source: Green Line Association, 2005

Lebanon's faunal diversity is also high relative to its surface area (0.28 species/km^2) with nearly 2,900 described species. Few notable species include the endangered endemic Lebanon's mountain viper (*Montivipera bornmuelleri* (Werner, 1898)), and the critically endangered endemic Ammiq Garra (*Garra festai*).

At present, much of Lebanon's biodiversity is heavily threatened by human activities. Although no official national red list exists for Lebanon, the number of threatened species (fauna and flora), according to the IUCN Red List, is:

- Mammals: 15 species
- Birds: 28 species
- Reptiles: 7 species
- Plants: 227 species

Lebanese laws, decrees, ministerial decisions and resolutions protect many of the natural sites in the country. The sites are classified and protected to a varying degree at the national level, and include nature reserves, protected forests, natural sites under the protection of MoE, and Hima (local community-based conservation practice). As shown in Figure 7 in NT 4, ca. 2.4% of the area of Lebanon is covered by nature reserves, to which we should account for additional protected forests as per law 558/1996, nature sites under the protection of MoE, Himas, and biosphere reserves.

Some of these sites have acquired one or more international designations. In Lebanon, there are currently 4 Ramsar sites, 5 UNESCO World Heritage Sites, 15 Important Bird Areas (IBAs) (under Birdlife International), 1 Specially Protected Area (SPA) and 2 Specially Protected Areas of Mediterranean Importance (SPAMI) (under the Protocol of Specially Protected Areas and Biodiversity of the Barcelona Convention).

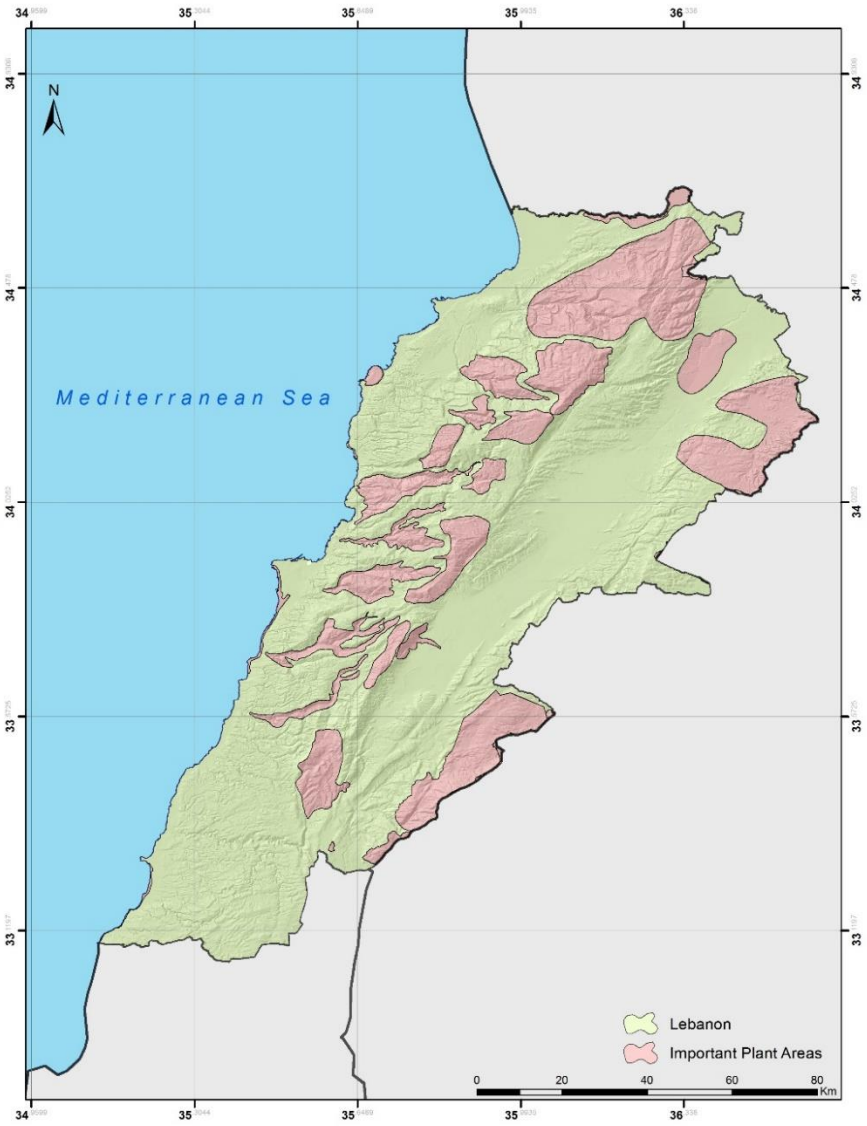


Figure 25 Important Plant Areas

Source: UN Biodiversity Lab, 2018

Main pressures on and drivers of change to biodiversity (direct and indirect)

Threats to biodiversity in Lebanon mostly stem from human activities and can be summarized as follows:

- Habitat loss, degradation, fragmentation and destruction:
  - Urban sprawl
  - Destruction of coastal zones
  - Coastal landfilling
  - Illegal dumping sites: In Lebanon, there are more than 900 dumpsites as identified in the 2016 Updated Master Plan.

- Quarries (legal, illegal, operational and abandoned): reports on the number of quarries in Lebanon indicate a range between 710 to more than 1,800, however, official figure indicates 710 most of which are abadoned.
- Eroded sites due to illegal clearing of vegetative cover.
- Forest Fires

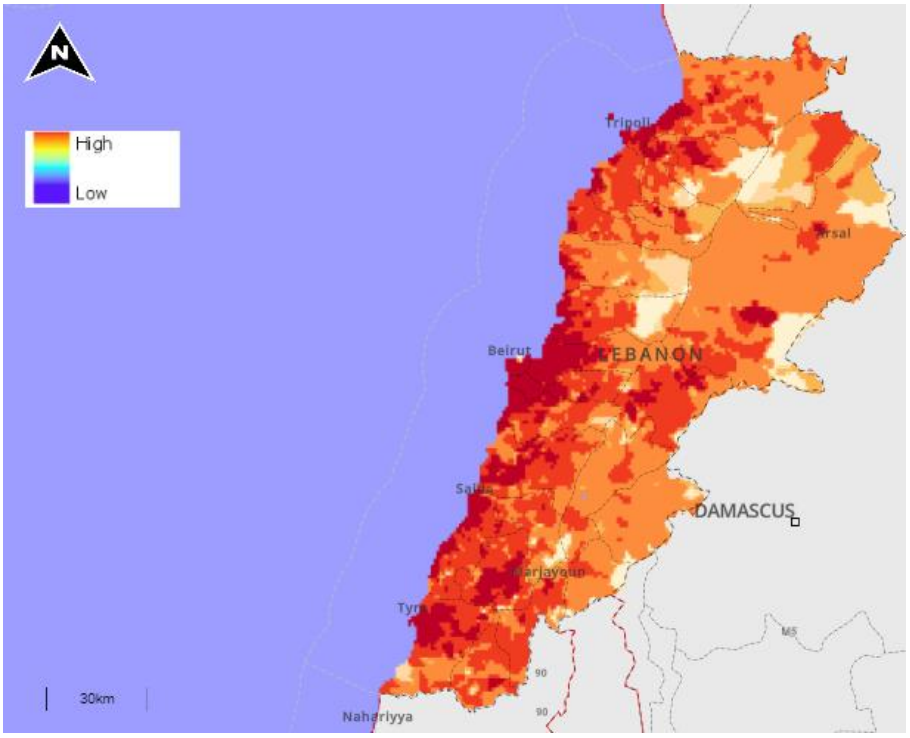


Figure 26 Population Density

Source: UN Biodiversity Lab, 2018

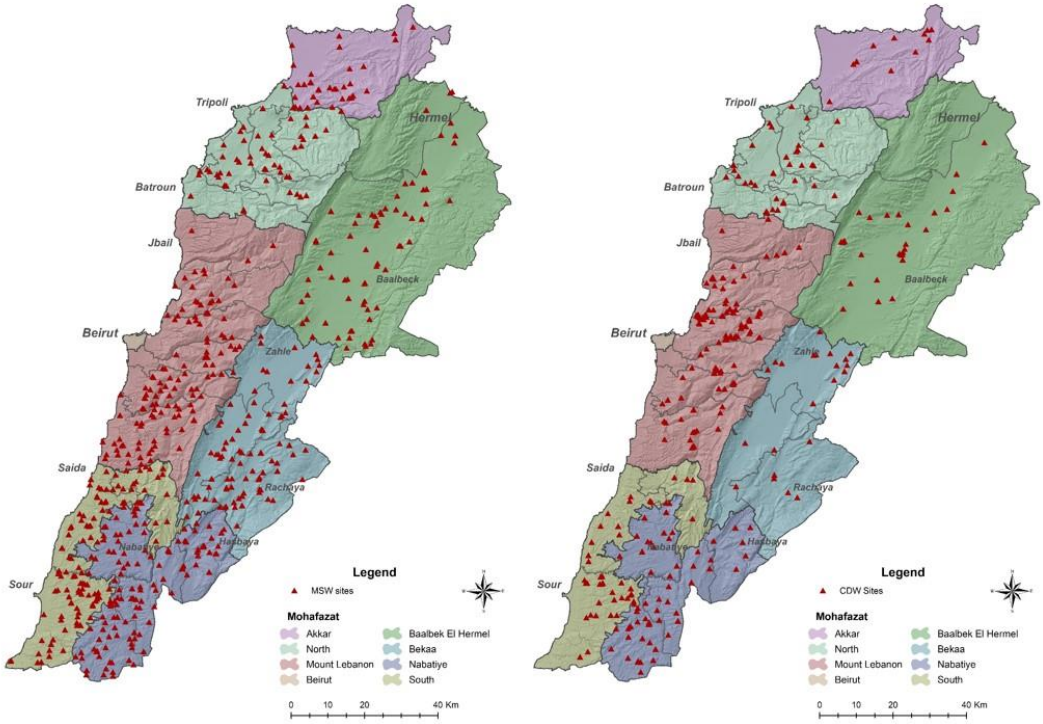


Figure 27 MSW and CDW Dumpsites

Source: UNDP/MoE/ELARD, 2016[2]

[2] UNDP/MoE/ELARD, 2016. Updated Master Plan for the Closure and Rehabilitation of Uncontrolled Dumpsites.

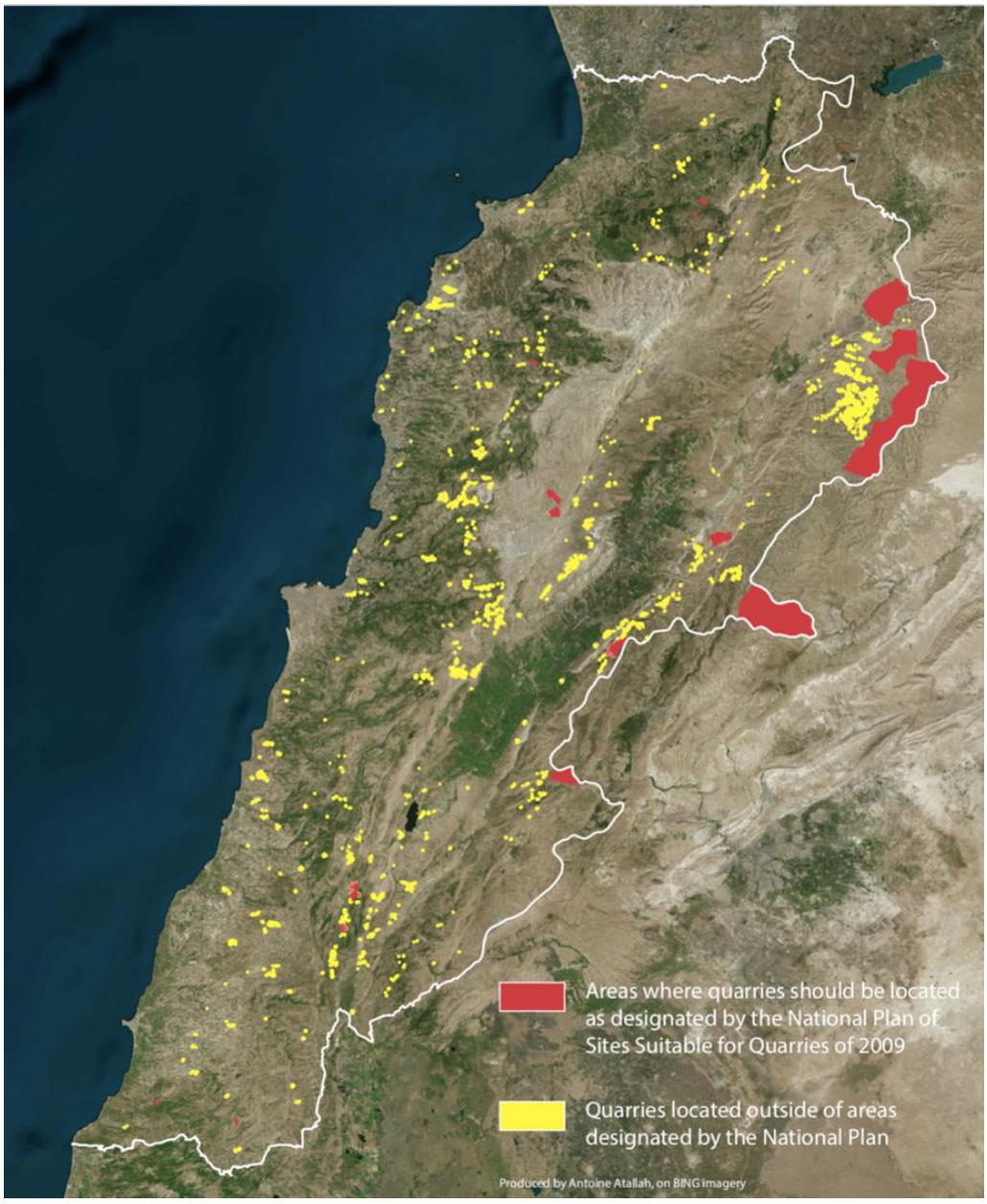


Figure 28 Illegal Quarries in Lebanon

Source: Antoine Atallah, 2018

- Invasive Alien Species
  - Introduction of marine species through the Suez Canal
  - Mismanagement practices of imported ornamental plants
- Pollution:
  - Industrial waste and effluents
  - Solid waste
  - Wastewater discharges
  - Disposal of hazardous waste
  - Agrochemicals

  - Air emissions, especially in urbanized areas
- Overexploitation and unsustainable use of natural resources pertaining to
  - Hunting activities
  - Fishing activities
  - Harvesting activities, etc.
- Climate change:
  - Pest outbreaks
  - Water shortages
  - Sea-level rise, etc.

Generally, repeated periods of political tension have resulted in indirect destruction and unsustainable management practices. In addition to the refugees crisis which aggravated the pressure on natural resources and infrastructure.

Implementation of the NBSAP

Lebanon's first NBSAP was developed in 1998. In 2005, an addendum was prepared to align the targets of the existing NBSAP with the 2010 Global Biodiversity Target.

The new Strategic Plan for Biodiversity (SPB) and the Aichi Biodiversity Targets (ABTs) for the period 2011-2020 agreed on at the 10th meeting of the Conference of the Parties (COP-10) requires countries to revise their existing NBSAPs and to reinvigorate their implementation.

Lebanon has updated its NBSAP in 2016 which led the selection of **13 Priority areas**. The Plan also defined **18 National Targets** (NTs) and **91 National Actions** (NAs) that were developed to support the implementation of the NTs. The NTs integrate the ABT to which the NBSAP update was based on. Lebanon's NBSAP was approved by the Council of Ministries through Decision 62 dated April 4, 2018.

Measures to implement the NBSAP include the expansion of protected areas, biodiversity studies and updates, elaboration of national laws and policies, capacity-building and public awareness-raising, creation of partnerships with local stakeholders, NGOs and international agencies and implementation of operational projects. However, lack in strong government commitment towards the implementation of NBSAP and resource availability, particularly because biodiversity is not considered a national priority, is hindering NBSAP implementation efforts.

Overall actions taken to contribute to the implementation of the Strategic Plan for Biodiversity 2011-2020

Significant progress has been made in terms of biodiversity protection since the preparation of the first NBSAP in 1998, with improvements in the legal framework, notably in relation to *in situ* conservation (terrestrial and marine protected areas), legislation development (SEA and EIA decrees, Revised Hunting Law and associated decrees and decisions, Establishment of the National Council for the Environment and establishment of the environmental police) and awareness raising in public and private settings (the creation of magazines tackling environmental and sustainable development issues at the global, regional and local levels).

Support mechanisms for national implementation (legislation, funding, capacity-building, coordination, mainstreaming, etc.)

Measures taken by the Lebanese country, whether by the government or by local stakeholders to a lesser extent, reflect their serious efforts towards the implementation of the NBSAP. Attention was given to several areas addressing biodiversity protection. These efforts can be emphasized through the contributions of governmental institutions (MoE, MoA, CNRS, LARI, etc…) on collecting information for updating the terrestrial and marine biodiversity national inventories, influencing policies and laws, etc. Additionally, contributions from academic institutions include conducting national surveys on endemic and non-endemic flora and fauna, contribution to the development and update of national inventory on national species, etc.

A draft national law on access to Lebanese biological and genetic resources and sharing of the benefits arising from their utilization as part of the national implementation of the Nagoya Protocol has been submitted by the MoE to the CoM and is currently under review. Key ecosystems vulnerable to climate change have been identified in context of Lebanon's Third National Communication to the UNFCCC, besides other initiatives identifying some ecosystems vulnerable to fire risks and drought.

At the national level, particular attention is given to threatened species. Several initiatives were implemented for the conservation of threatened species whether by designating protected areas or developing legislation and strategies for protecting and conserving specific species. Lately MoE was in the process of declaring new protected areas.

Management plans for natural areas of high biodiversity values has been established under the scope of several projects including SALMA project supported by MoA and FAO, SLMQ project supported by MoE and UNDP, and the Deep sea nature reserve declaration led by MoE.

There is a national effort led by Observatoire Libano-Français de L'Environnement (O-LiFE) by CNRS for identifying and mapping major ecosystems and habitat types based on standardized criteria. This is in addition to the recognition of marine and terrestrial species as a resource with an economic value through conducting valuation studies on endemic and important species.

Land degradation is a major threat to the environment and its biodiversity in Lebanon. Degraded lands mostly include dumpsites, quarries, and forest lands destroyed by fires. In an attempt to remediate some of the degraded sites, measures were and are still being developed and implemented wherever possible and funds are being secured for that purpose. These include: development of technical guidelines for quarries rehabilitation, restoration of destroyed rangelands and forests, rehabilitation of dumpsites, etc. Several initiatives on public and private levels are trying to meet the 40 M trees replantation target set by the GoL to offset land degradation and pollution.

Figure 29 Forest Map of Lebanon

Source: MoA and FAO, 2005

In 2013, a collaborative work was initiated between the Ministry of Environment (MOE) and the Institute of the Environment, University of Balamand (IOE-UOB), regarding the execution of the data analysis related to wildfires in Lebanon. The main goal of this collaboration is to produce a yearly report on wildfire occurrence and the extent of burned areas in Lebanon.

The analysis is done based on the data provided in the fire ID cards filled in by the Internal Security Forces (ISF) and copied to the Ministry of Environment, knowing that the fire ID cards format was issued through the notification of the Presidency of Council of Ministers number 256 dated 1/3/2008. At present, ten annual wildfire reports were issued through this collaboration, covering the wildfire's data from the year 2008 till 2018, presented in Appendix A.

The report on wildfire comes in line with the highlights of the technical requirements of Lebanon's National Strategy for Forest Fire Management (endorsed by Council of Ministers Decision No. 52 dated 13/5/2009) by working towards the unification of fire information and data as a means to empower efforts in understanding better the problem of wildfires in Lebanon.

Significant efforts have been devoted to educate and raise awareness on biodiversity issues through capacity building and awareness campaigns organized by MoE, MoA, UNDP, universities, NGOs or other local stakeholders. At the national level, MEHE is redrafting the Lebanese curriculum to include environment and biodiversity related topics in addition to the integration of extra-curricular programs and activities on these matters.

Ecotourism is being promoted and encouraged at the national level by MoE, MoT, nature reserves etc. and several public and private initiatives contribute to this, such as the Lebanon Mountain Trail Association that encourages conservation of natural resources, and promotes education, rural tourism and communication.

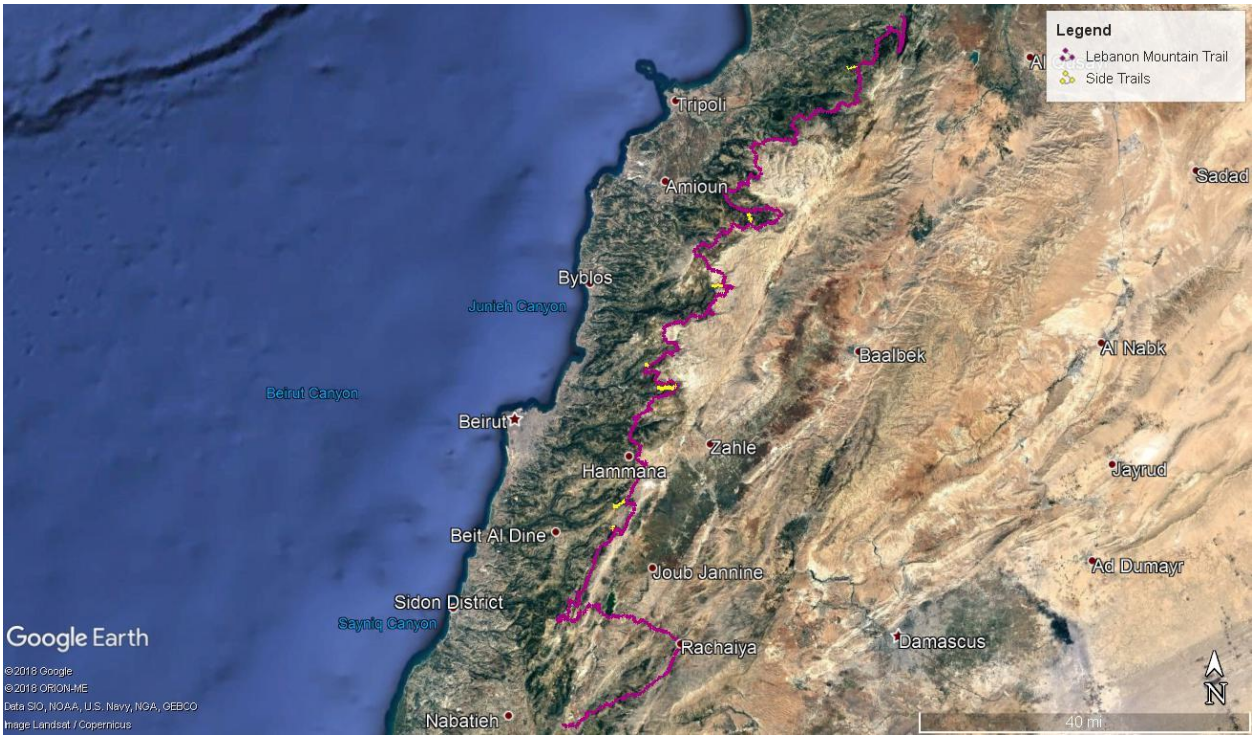


Figure 30 Lebanon Mountain Trail Sections

Source: LMT, 2018

To encourage the engagement of the private sector, MoPH issued Decree 167 dated 2017 which provides exemptions on incomes and customs for entities involved in sustainable environmental activities, besides other initiatives like green loans established by Banque du Liban and green banking initiatives supported by several banks.

The measures and activities identified in the 6NR, although limited, reflect that efforts are being made to improve biodiversity conservation and protection and sustainable use in Lebanon, which is indirectly contributing to the NBSAP.

Mechanisms for monitoring and reviewing implementation

The main challenges facing proper implementation of NBSAP are related to the lack of proper mainstreaming among various authorities on developed and implemented initiatives and programs related to biodiversity issues. In addition, a lack in systematic monitoring due to limited resources led to a general deficiency in quantitative data in Lebanon, which hinders the ability to properly assess the implementation of the NBSAP and evaluate status and trends in biodiversity. This is primarily due to the absence of proper coordination among the various stakeholders and the absence of resources to support monitoring mechanisms.

NBSAP should be implemented by all ministries and relevant authorities (each according to its mandate), and awareness and educational programs should be coordinated among all stakeholders. Clear role and delegation of responsibilities and tasks defined within the institutions/ministries should be specified.

CHAPTER IV. CONCLUSION AND RECOMMENDATIONS

The 6NR was an opportunity for the Lebanese government to reflect on the implementation of NBSAP and understand main obstacles and challenges impeding its implementation.

Lebanon has realized significant achievements towards the implementation of its NBSAP, notably:

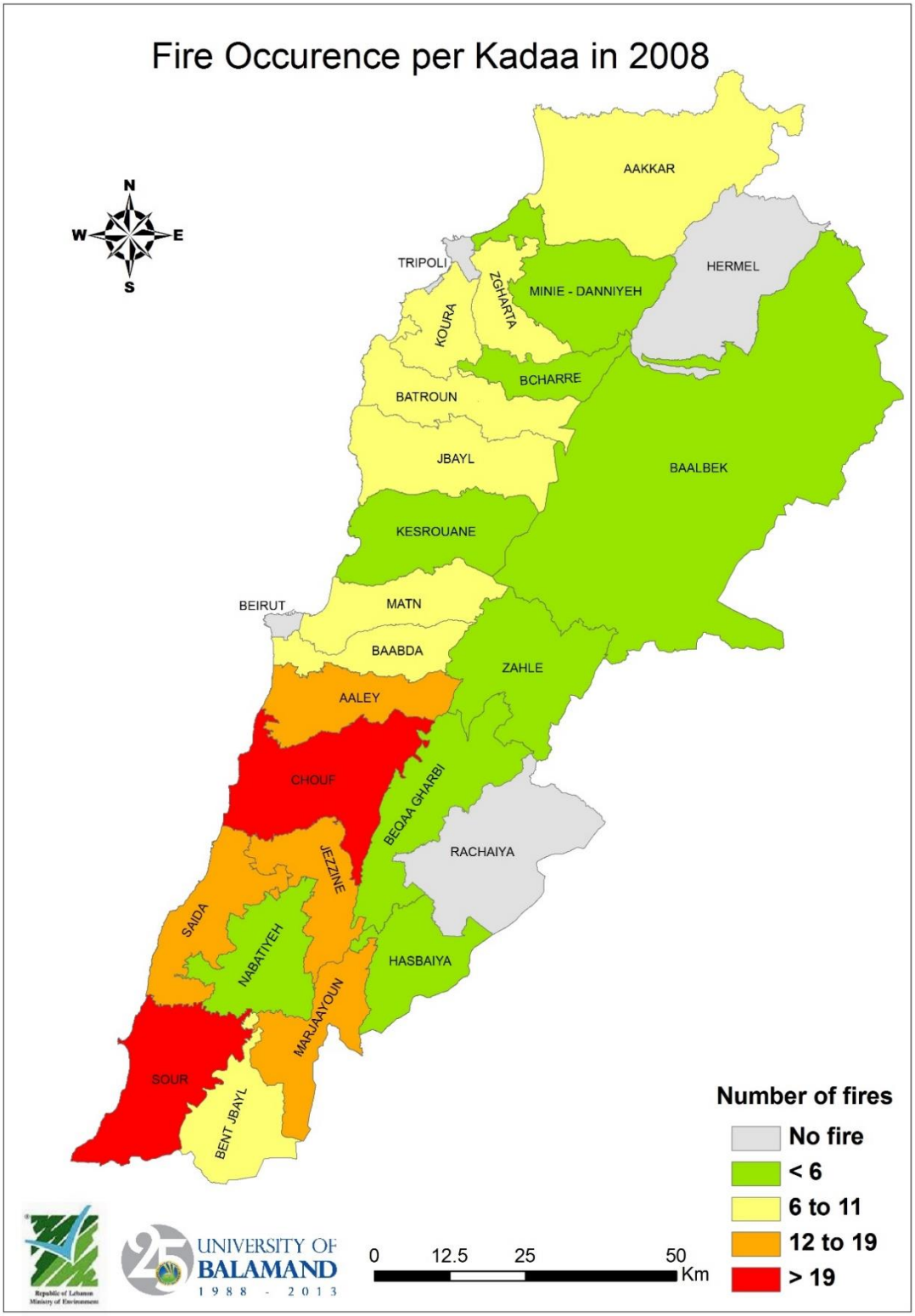
- Formal adoption of the NBSAP by the Government.
- Significant studies, surveys and assessments contributing to the range of data and information needed to make more informed decisions related to biodiversity conservation.
- Significant technical, administrative and legal work was done to increase the number of protected areas in Lebanon, and currently there are 9 draft laws aiming to establish new PAs in the pipeline.

Significant recommendations offered in this report are:

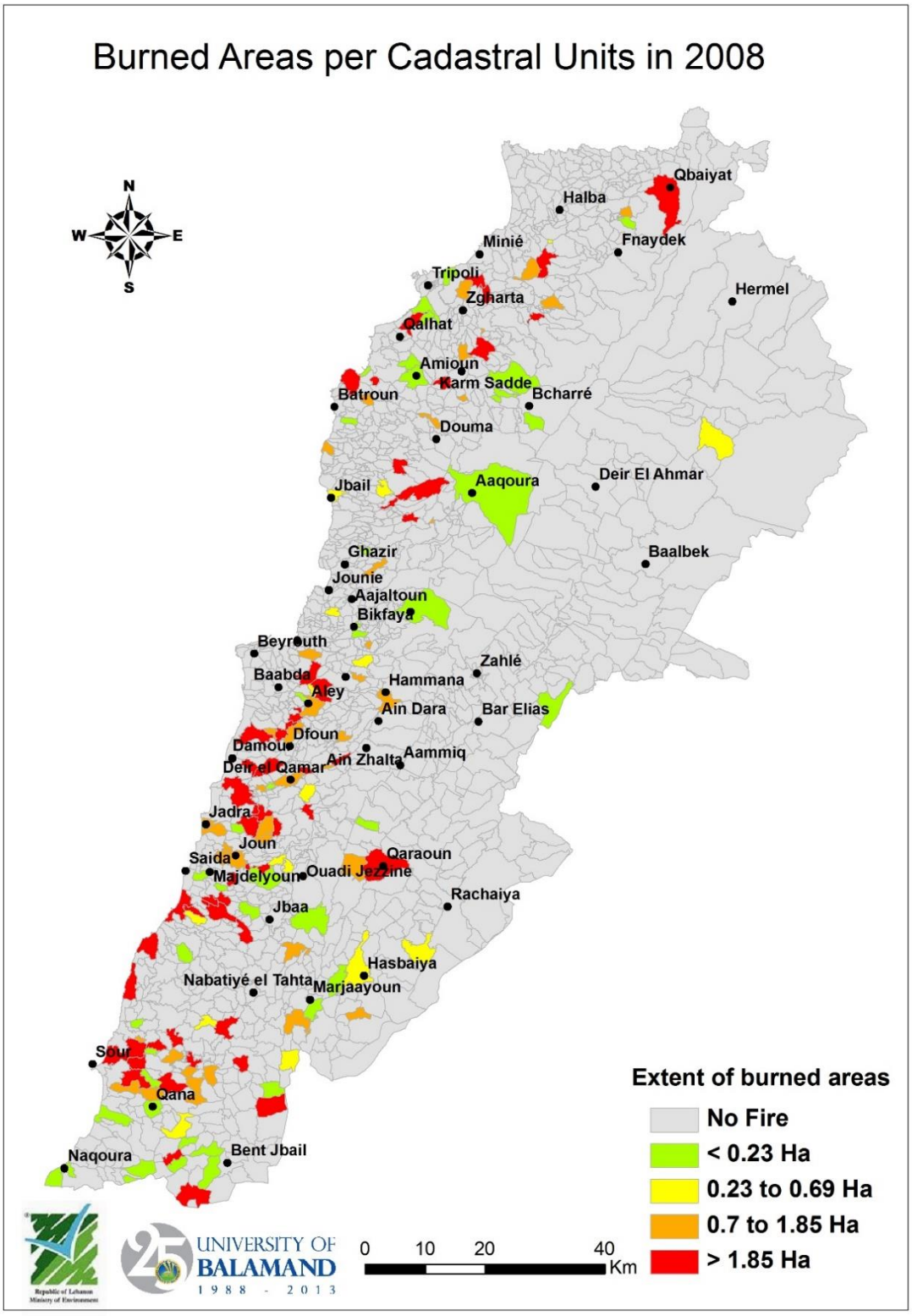
- Given that implementation of the NBSAP requires the commitment of various stakeholders and government agencies and following the adoption of the NBSAP by the GoL, it is critical that the various ministries and public agencies include in their national action plans and policies, and in their budgets and activities the relevant NBSAP National Actions they are responsible for. This will enhance not only the NBSAP implementation, but also the mainstreaming of biodiversity into other sectors.
- Significant research is being undertaken by academia; it is important that research be more effectively integrated into public policy and enabled to ensure it is put into action and supports NBSAP implementation, the same applies to studies and work done by NGOs.
- Once national budgets are mobilized to support NBSAP implementation, mobilization of the international community will be more effective and should be sought to fill gaps in financial resources; a programmatic approach to the NBSAP implementation is highly recommended to be adopted to ensure a holistic implementation rather than a piece-meal one.
- The project's Steering committee should be maintained as a tool for effective stakeholder coordination for the implementation of the NBSAP.

CHAPTER V. APPENDICES

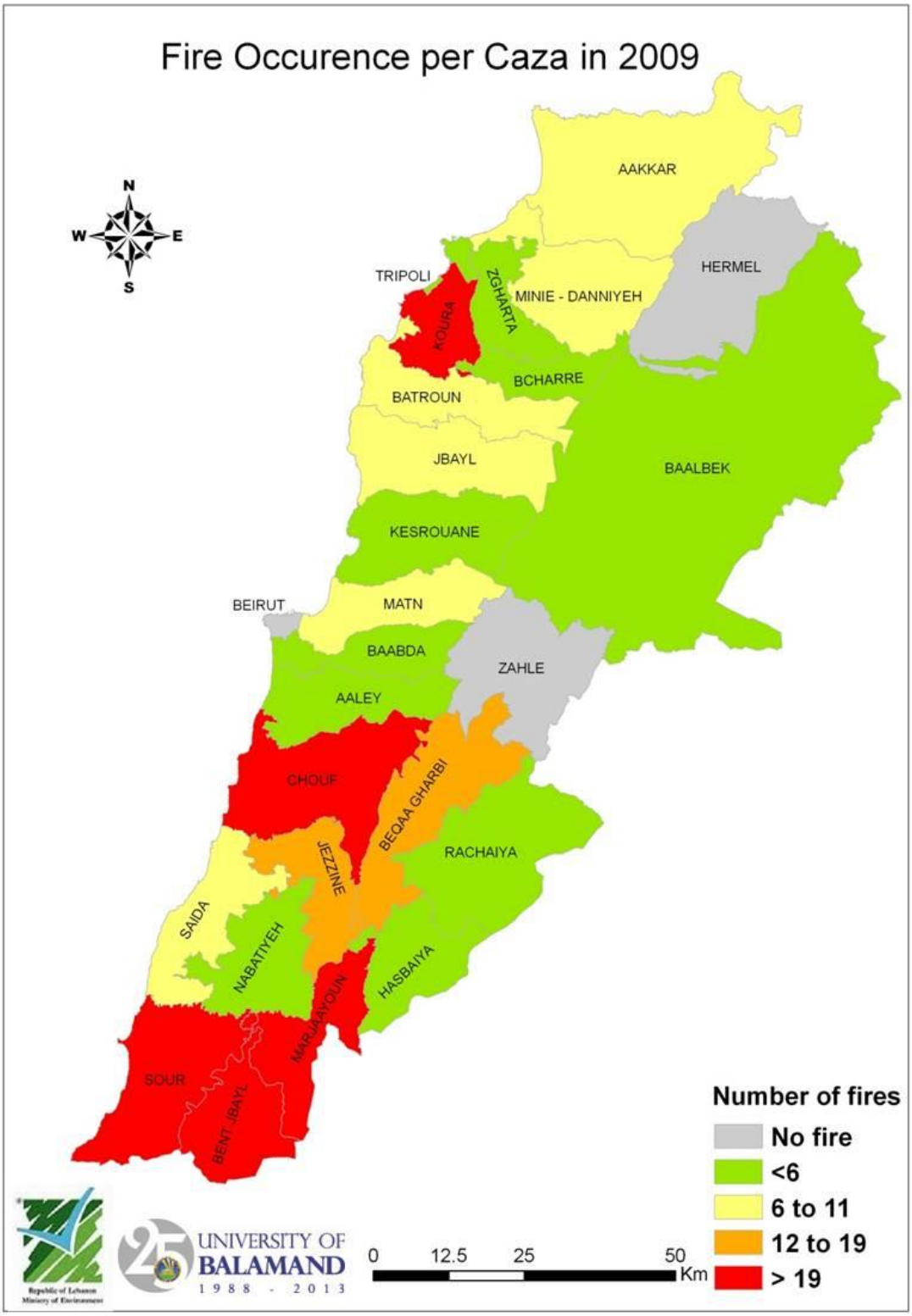
APPENDIX A – FOREST FIRE MAPS (2008 – 2018)



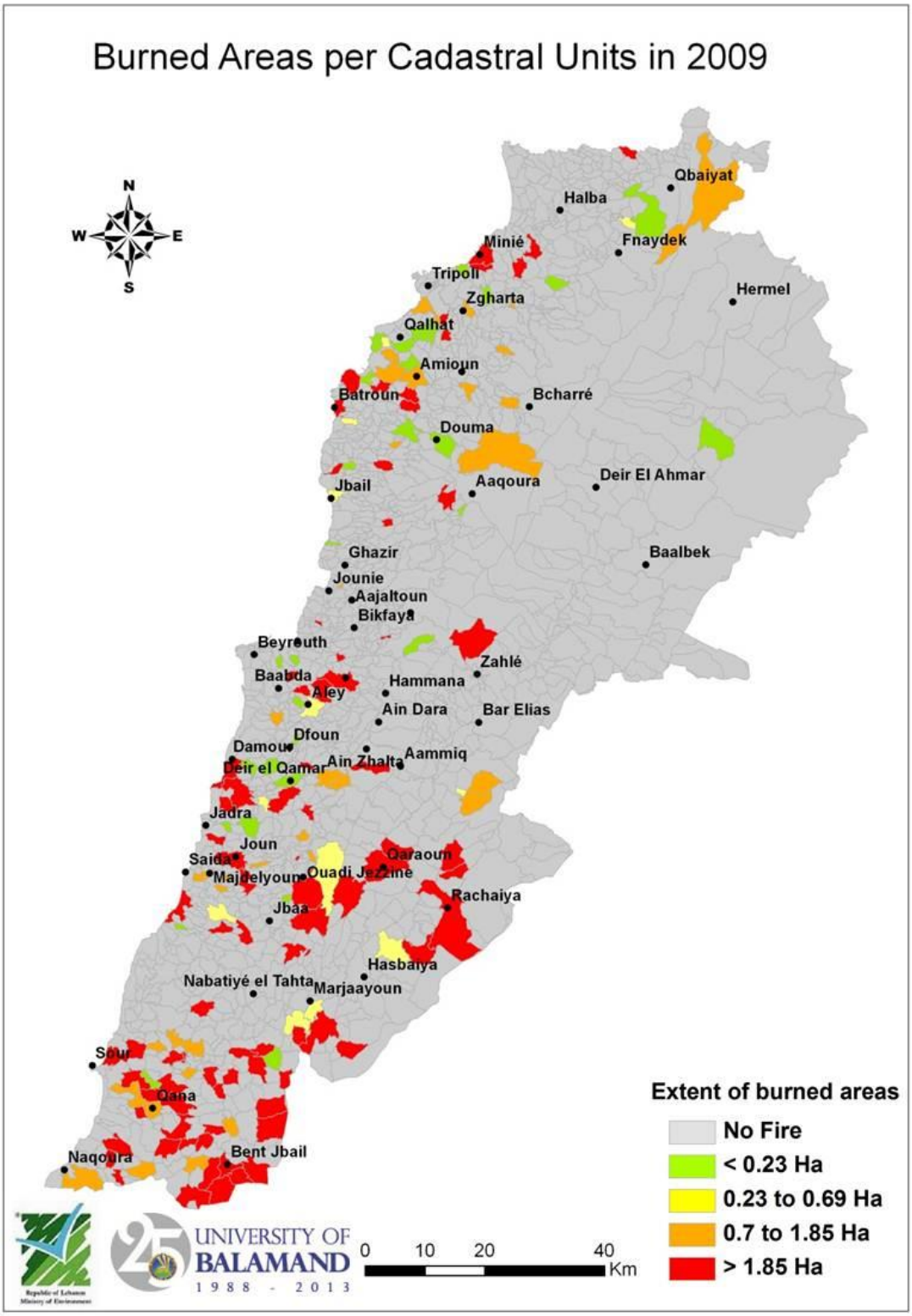
Source: IoB, 2018



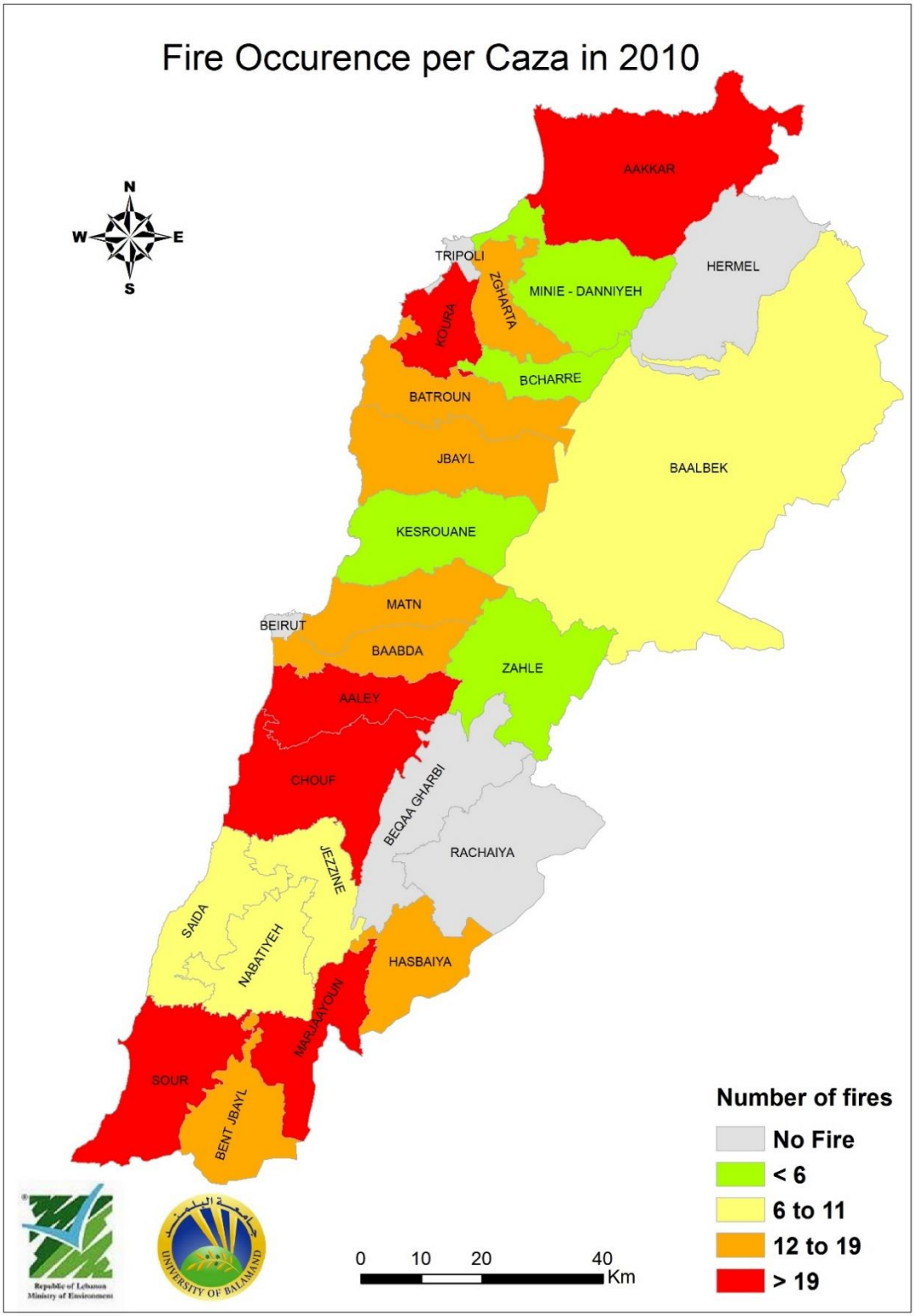
Source: IoB, 2018



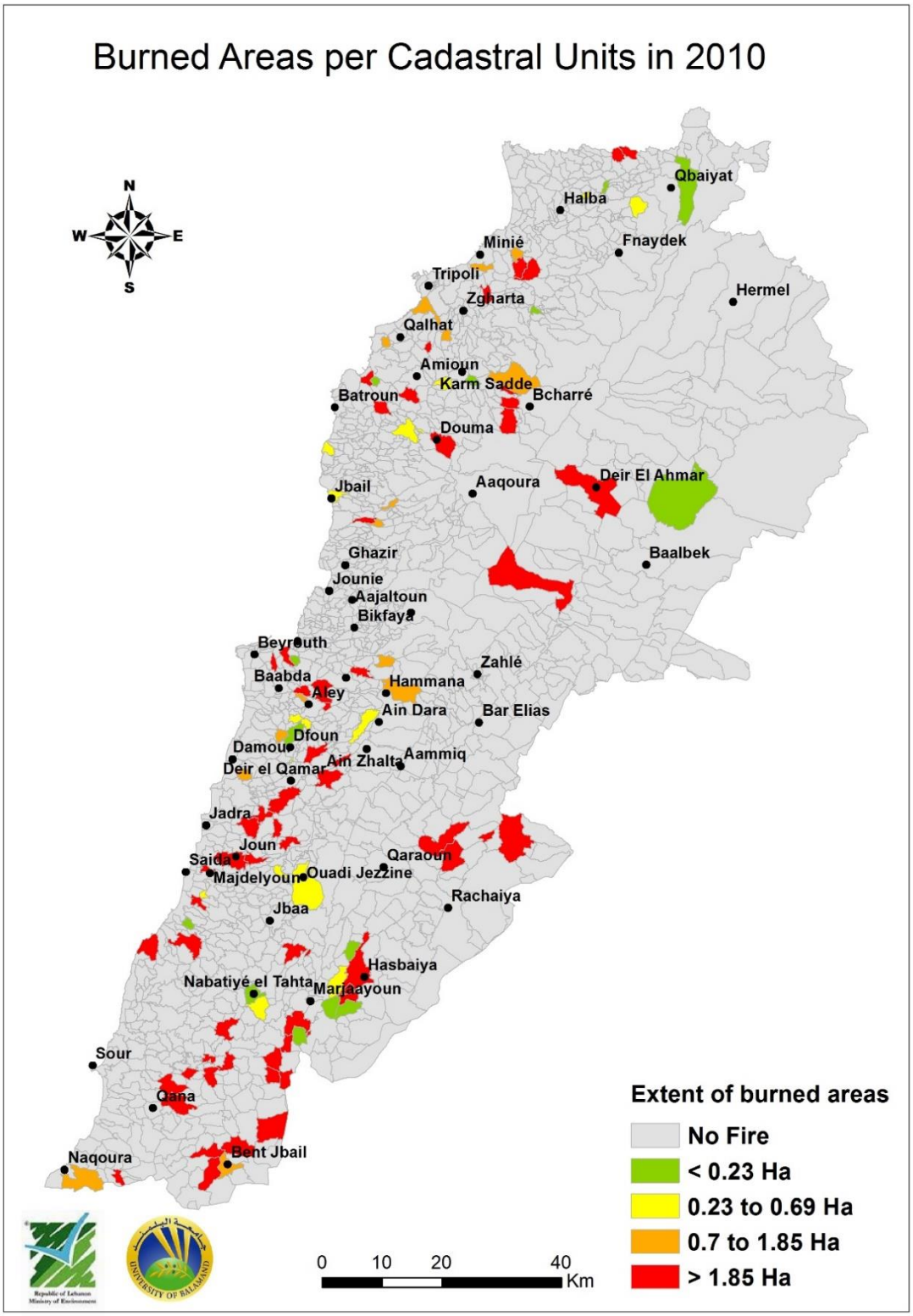
Source: IoB, 2018



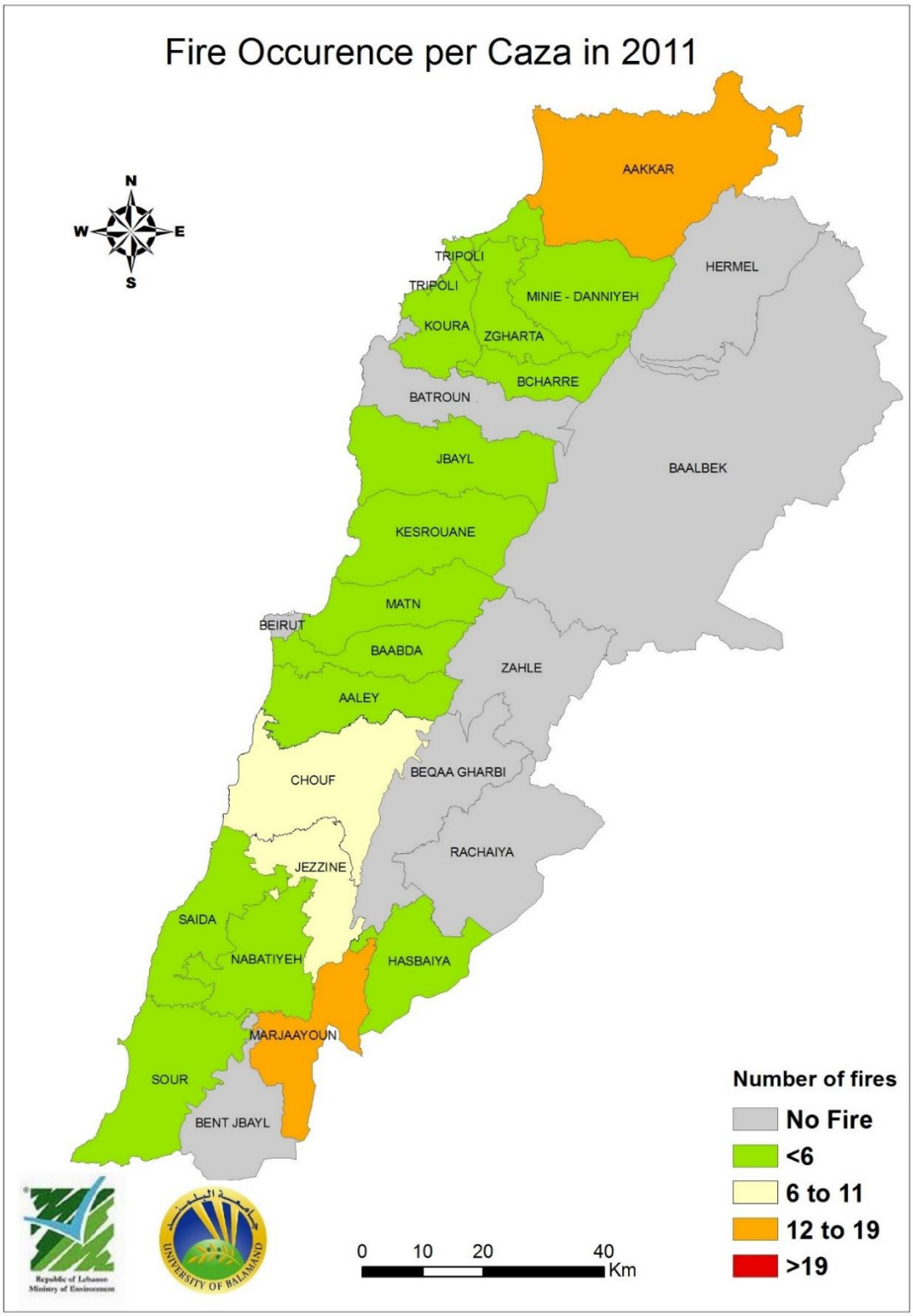
Source: IoB, 2018



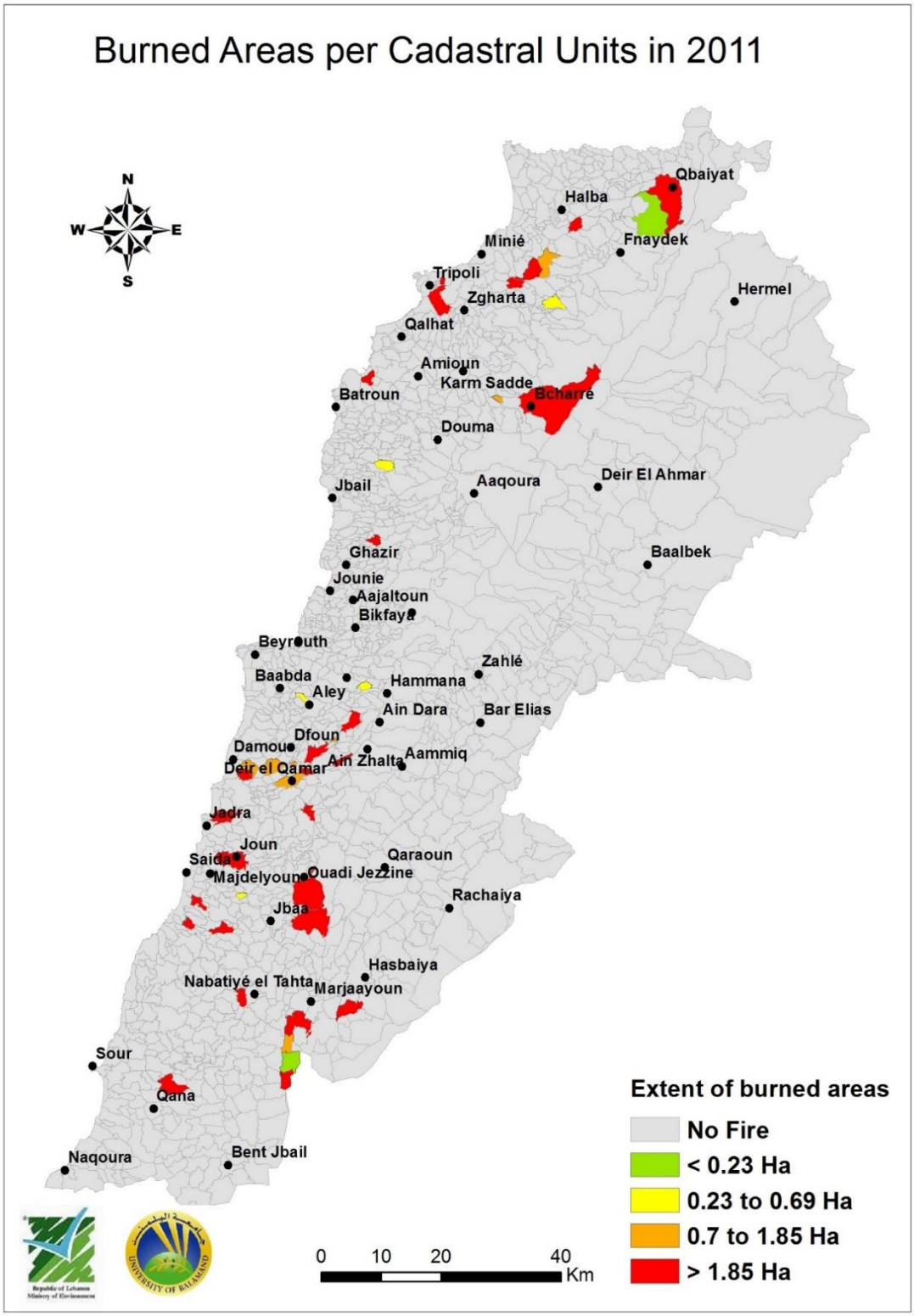
Source: IoB, 2018



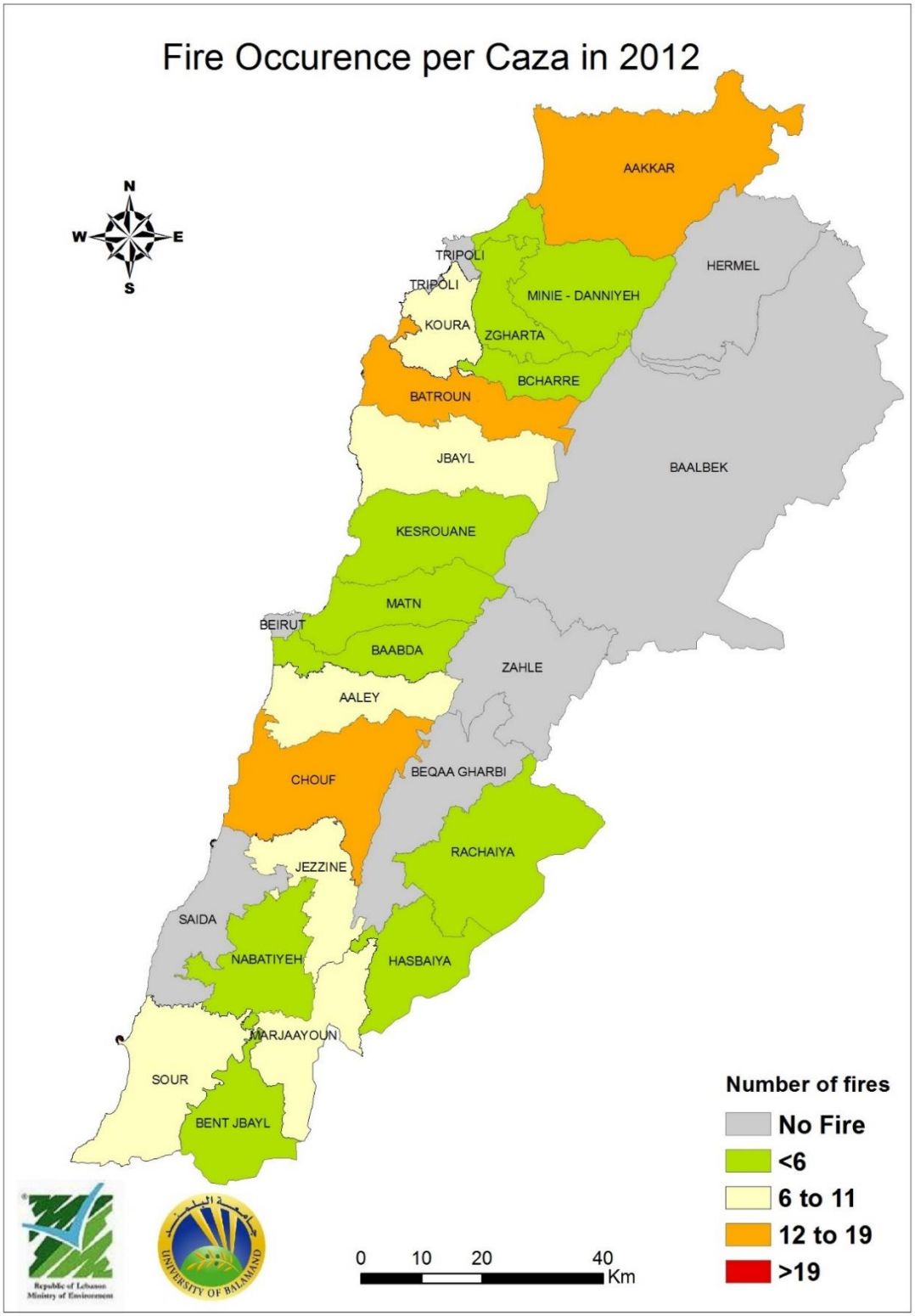
Source: IoB, 2018



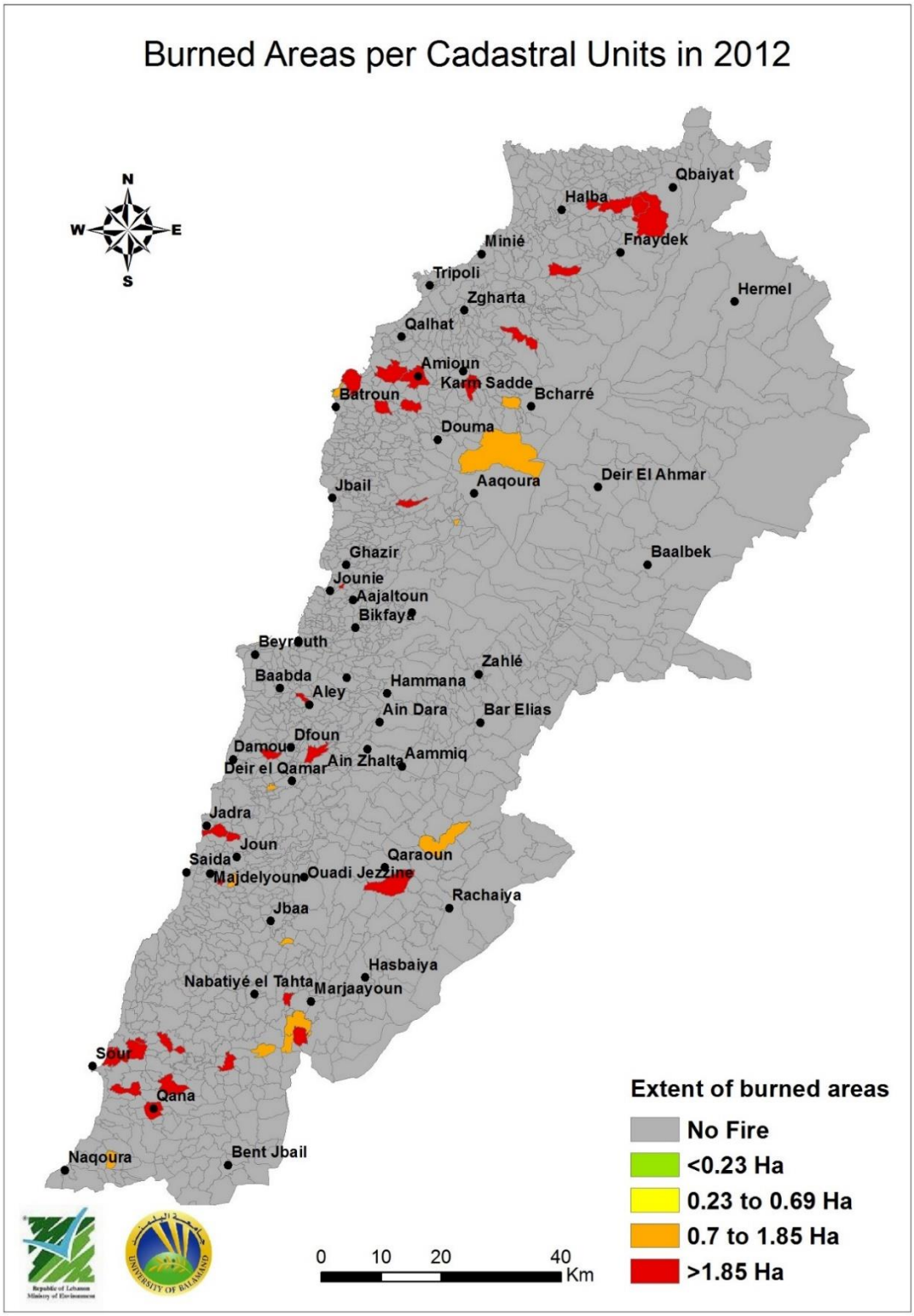
Source: IoB, 2018



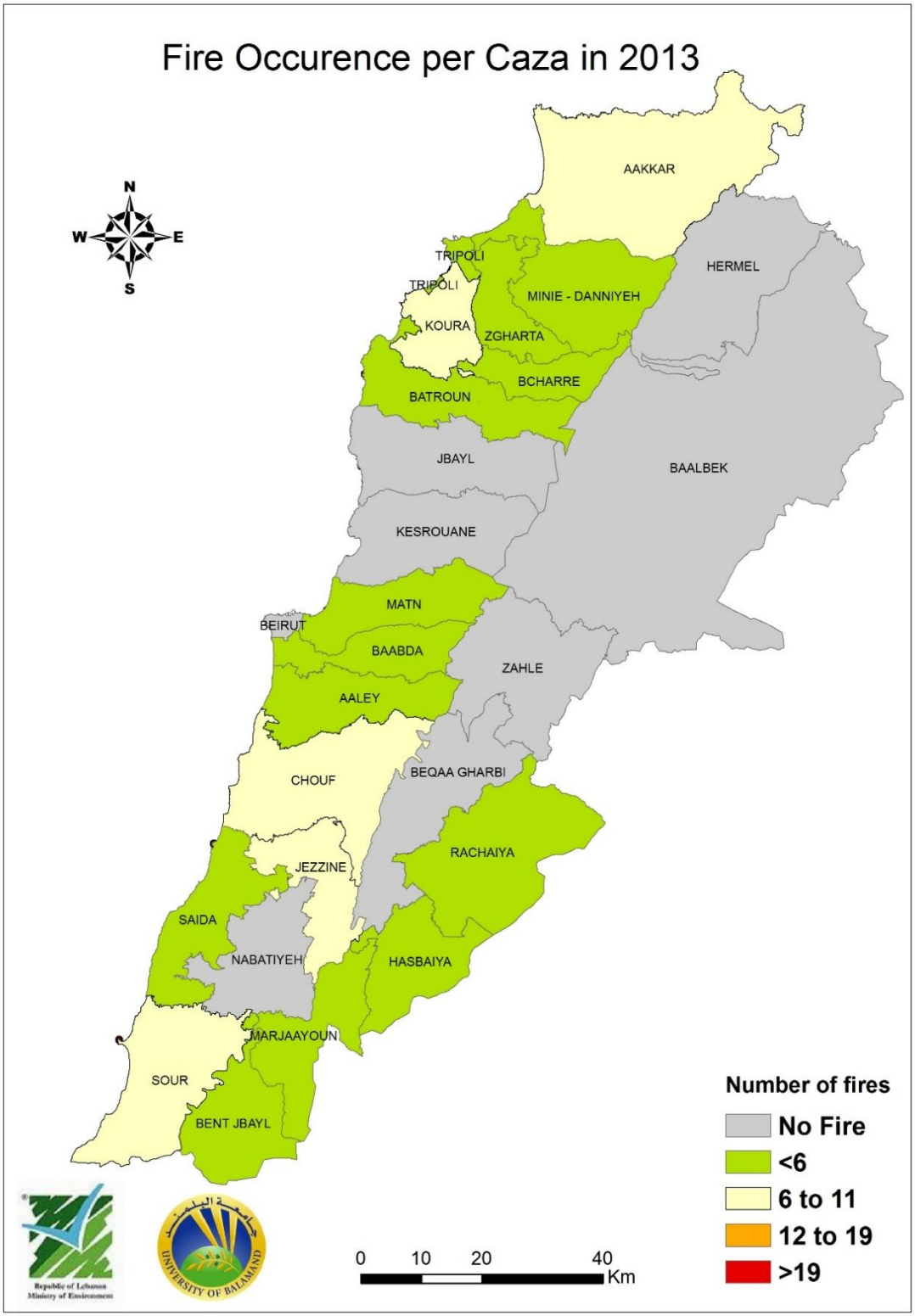
Source: IoB, 2018



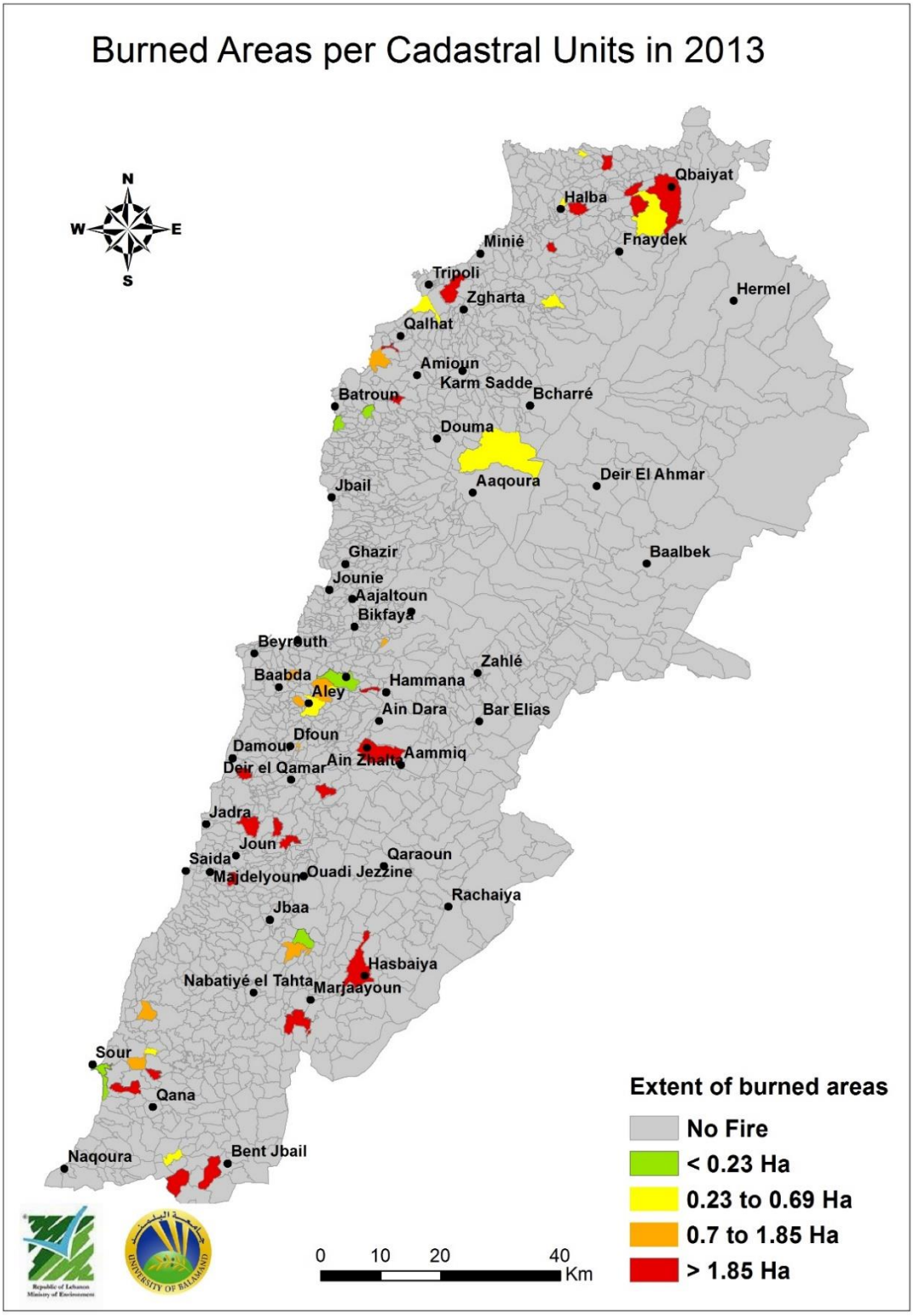
Source: IoB, 2018



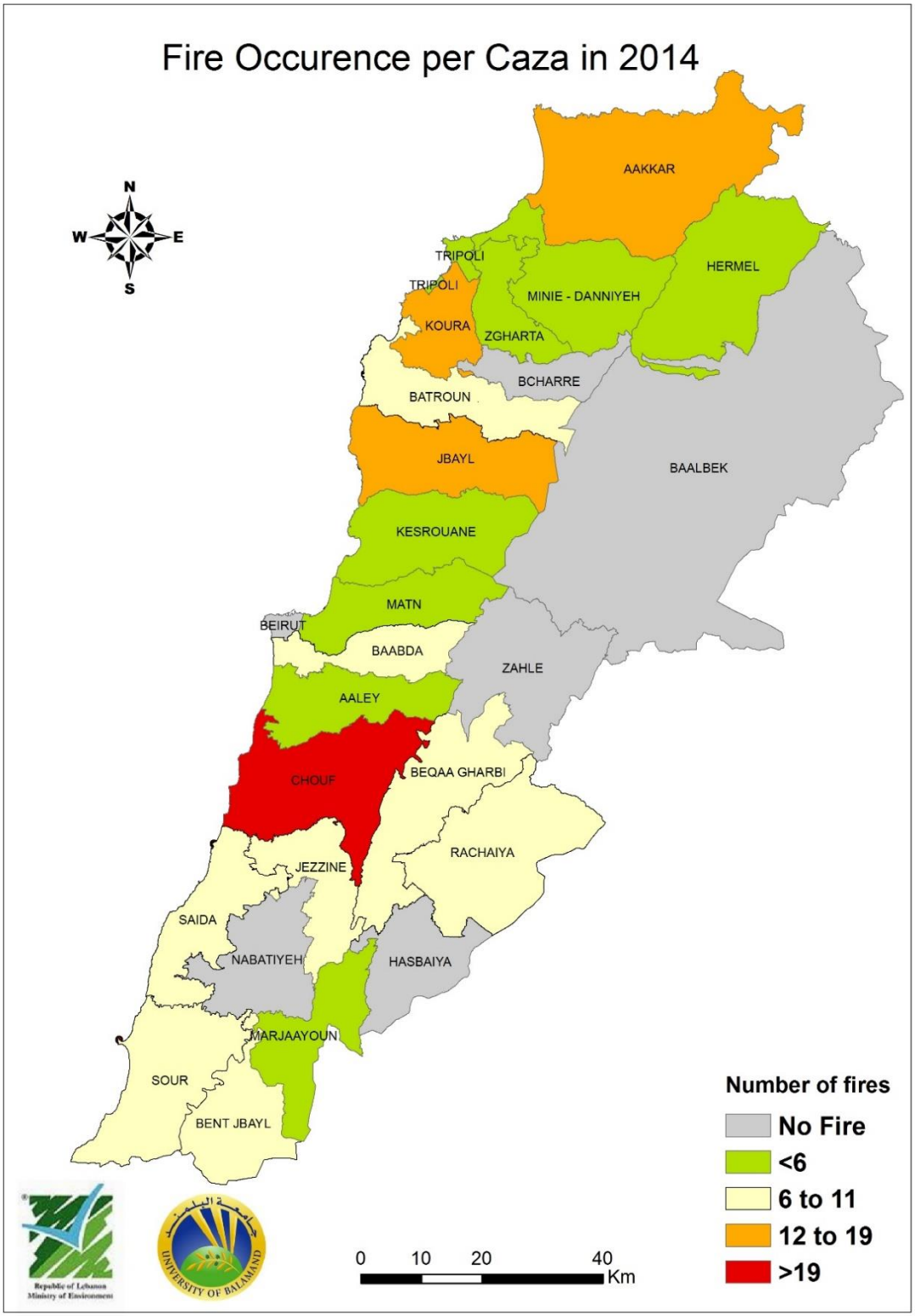
Source: IoB, 2018



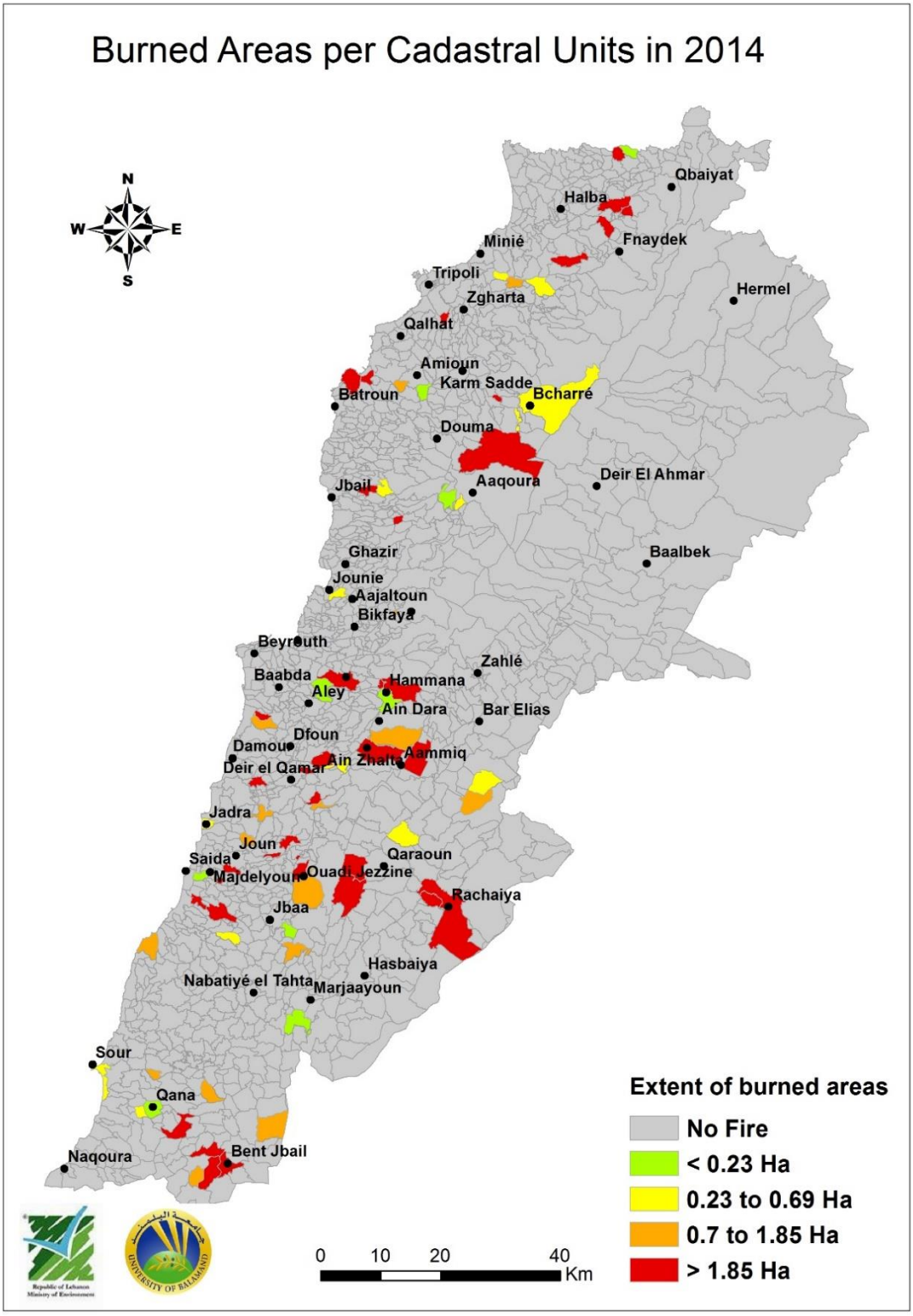
Source: IoB, 2018



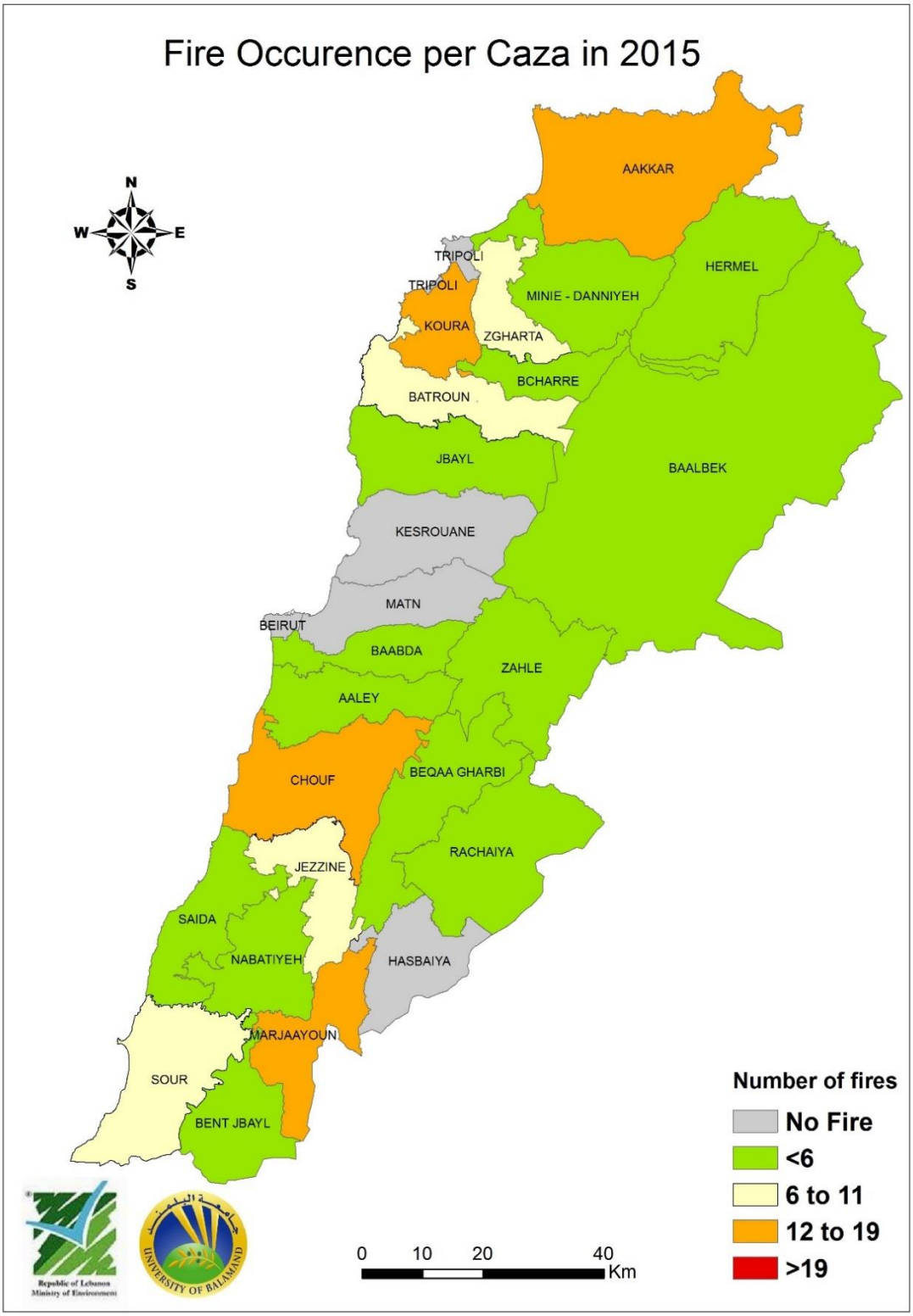
Source: IoB, 2018



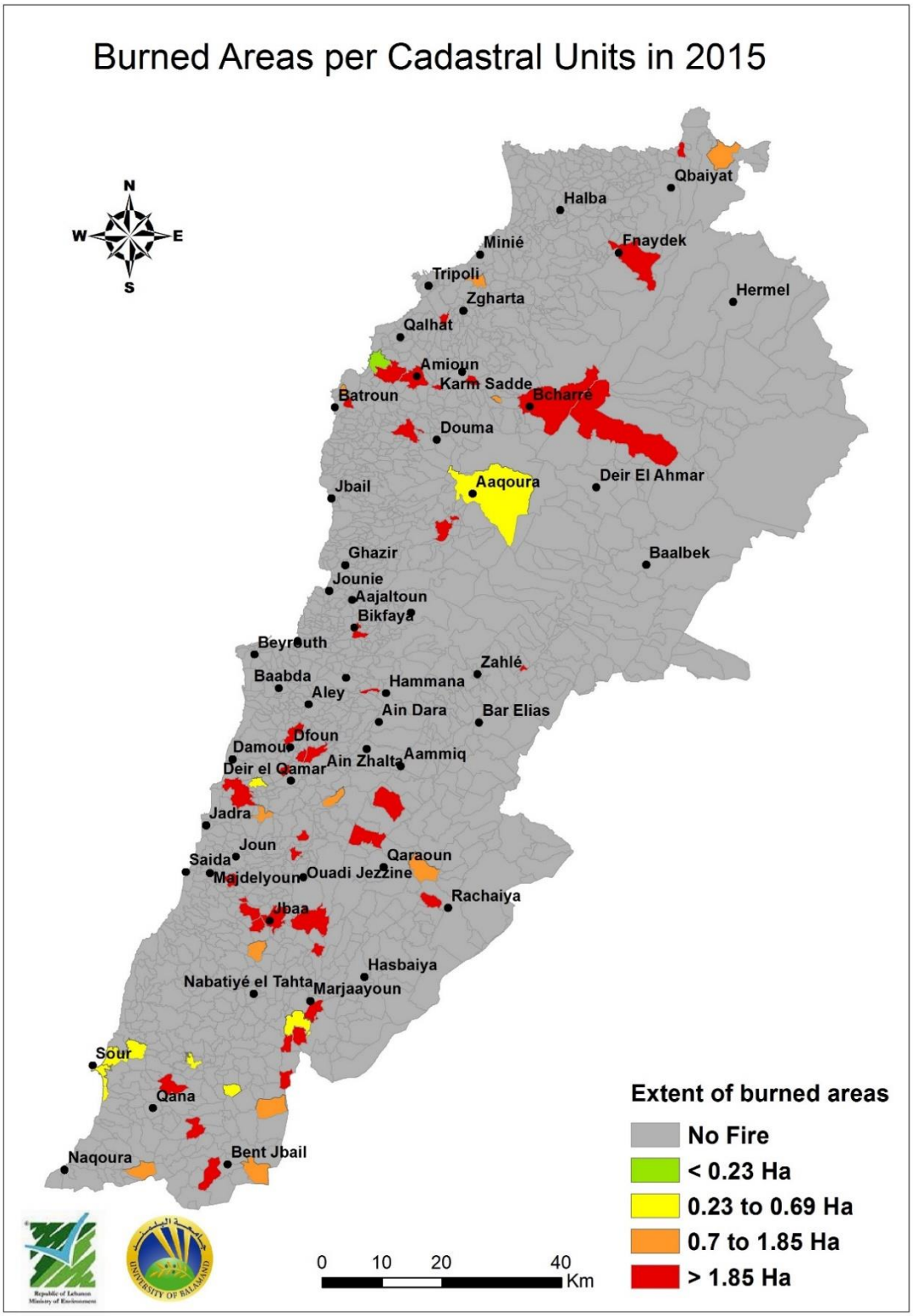
Source: IoB, 2018



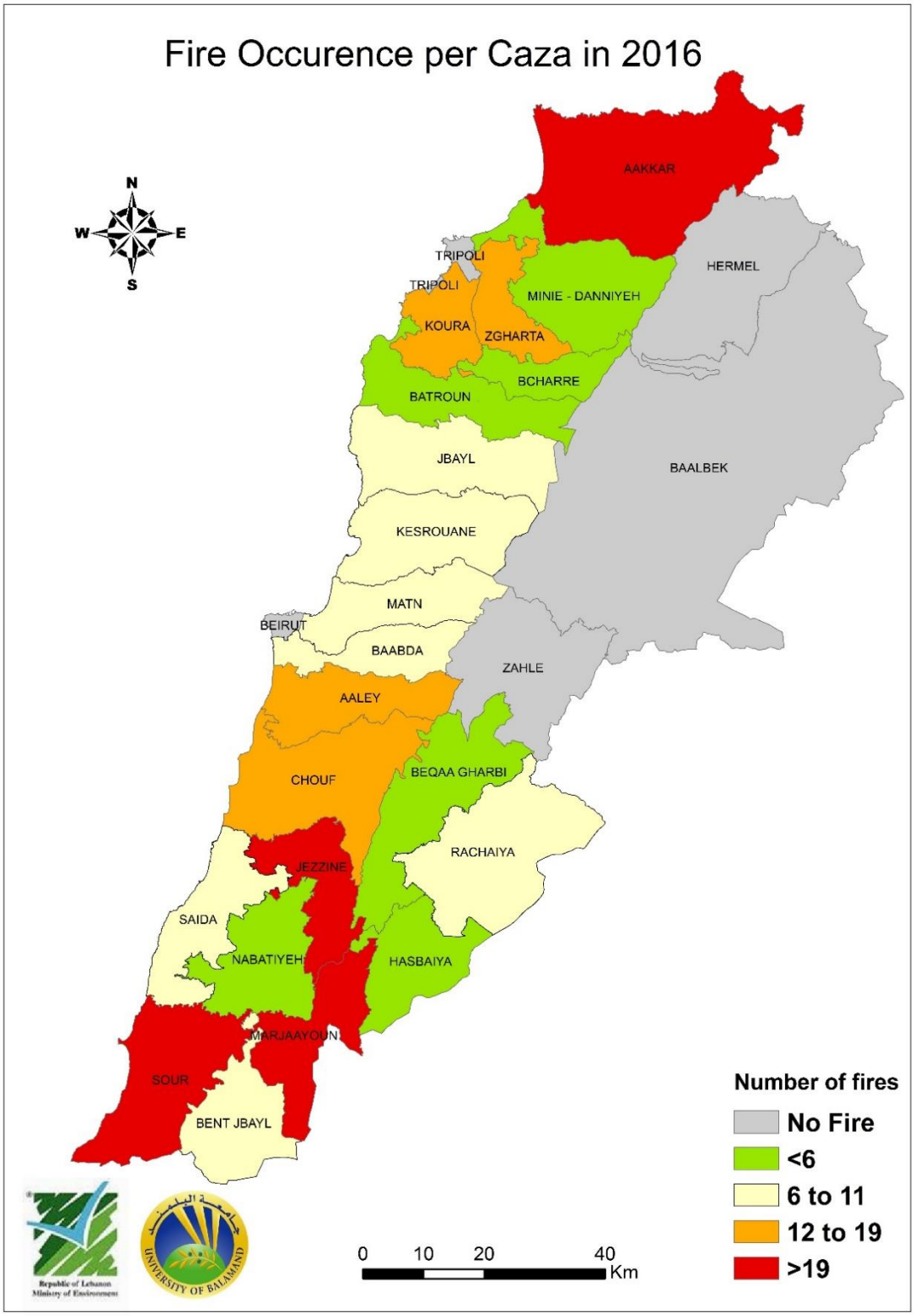
Source: IoB, 2018



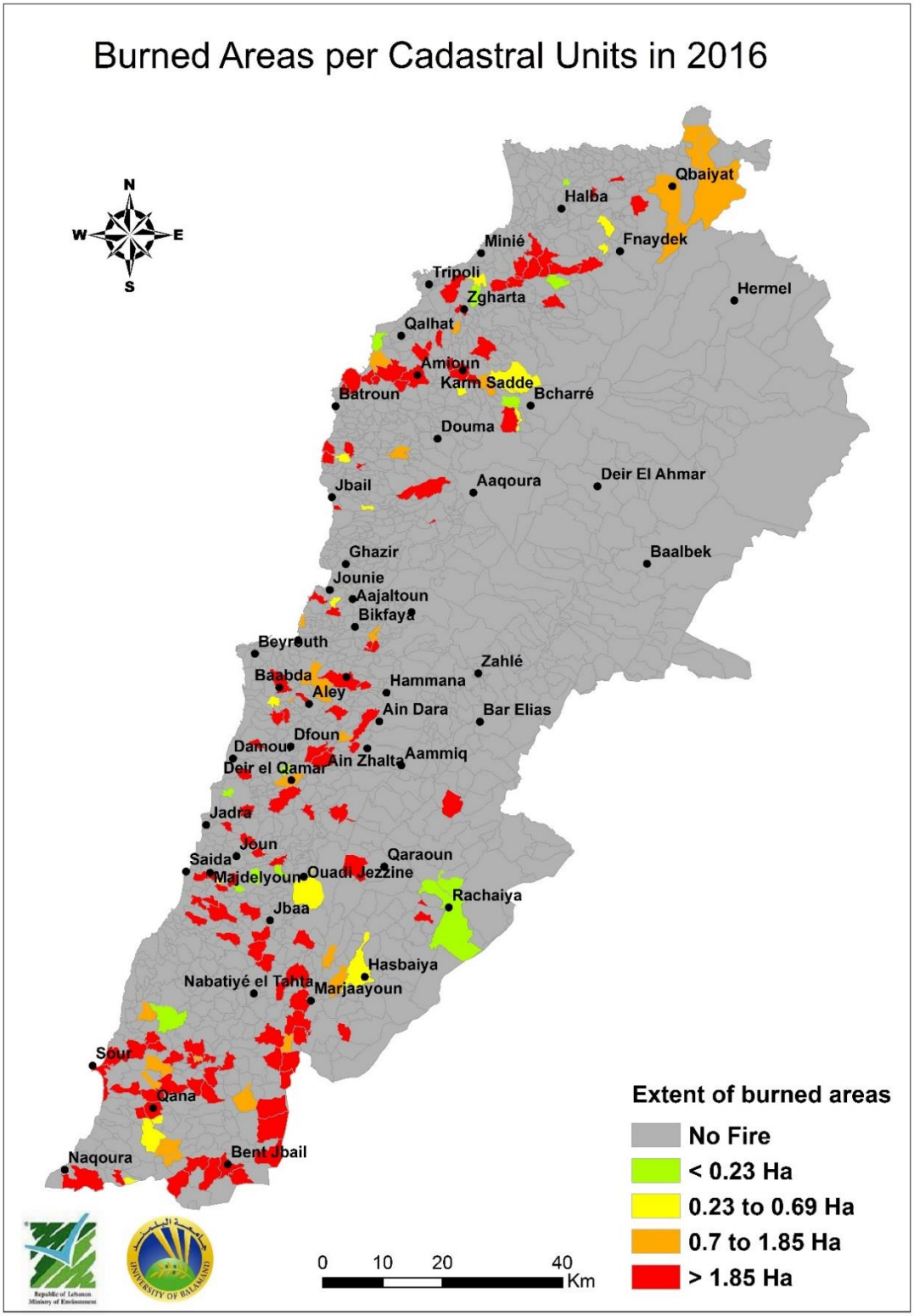
Source: IoB, 2018



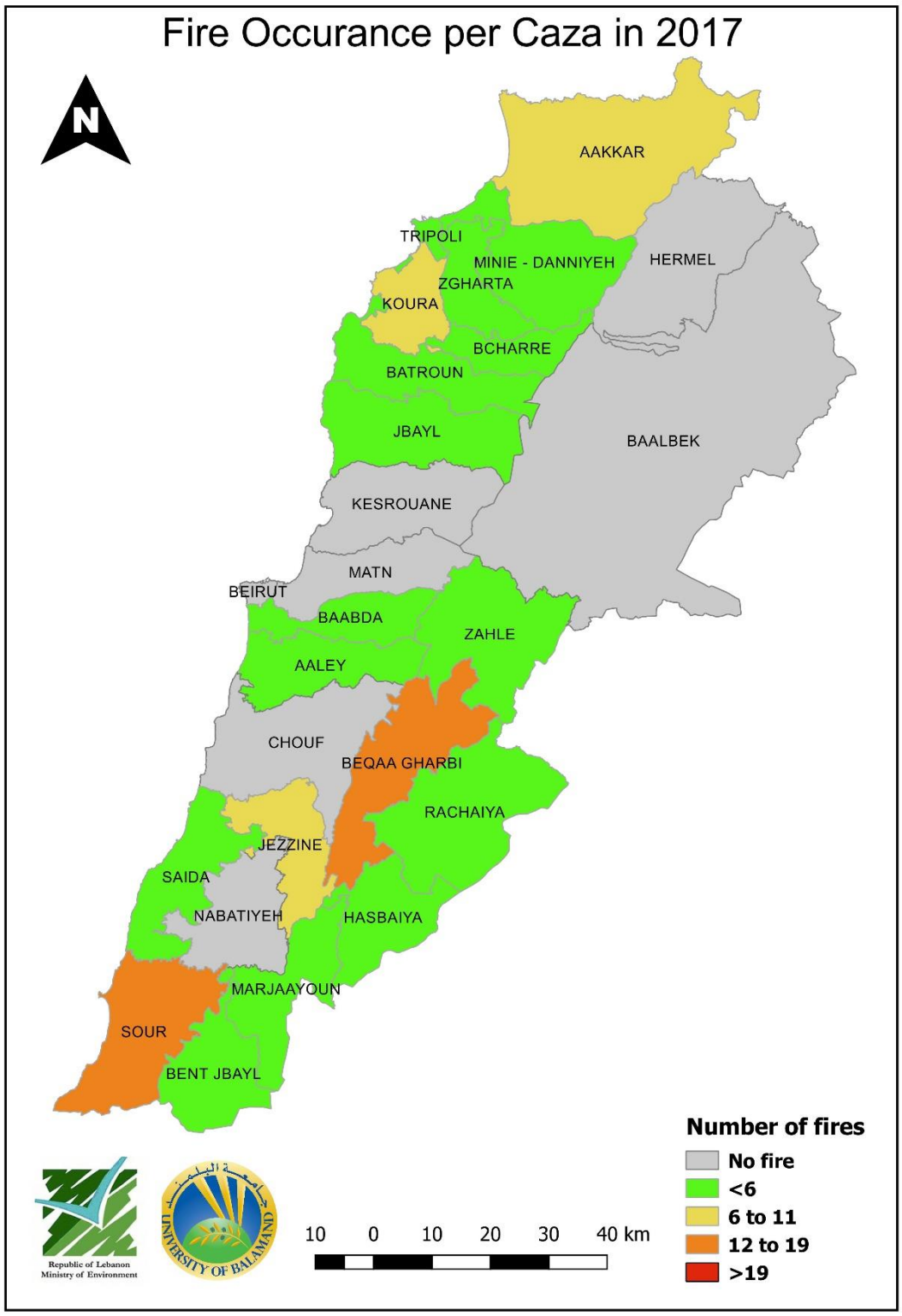
Source: IoB, 2018



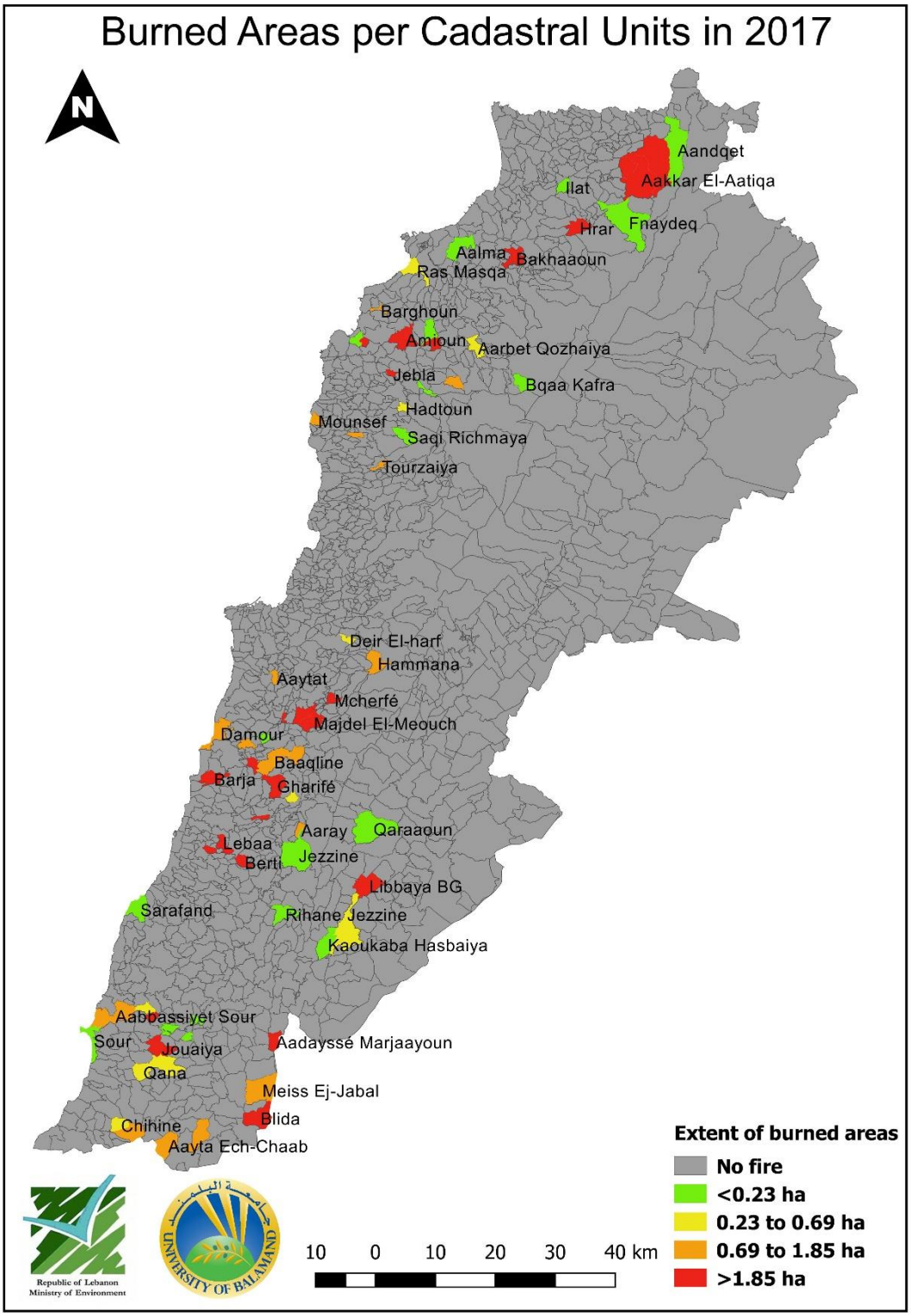
Source: IoB, 2018



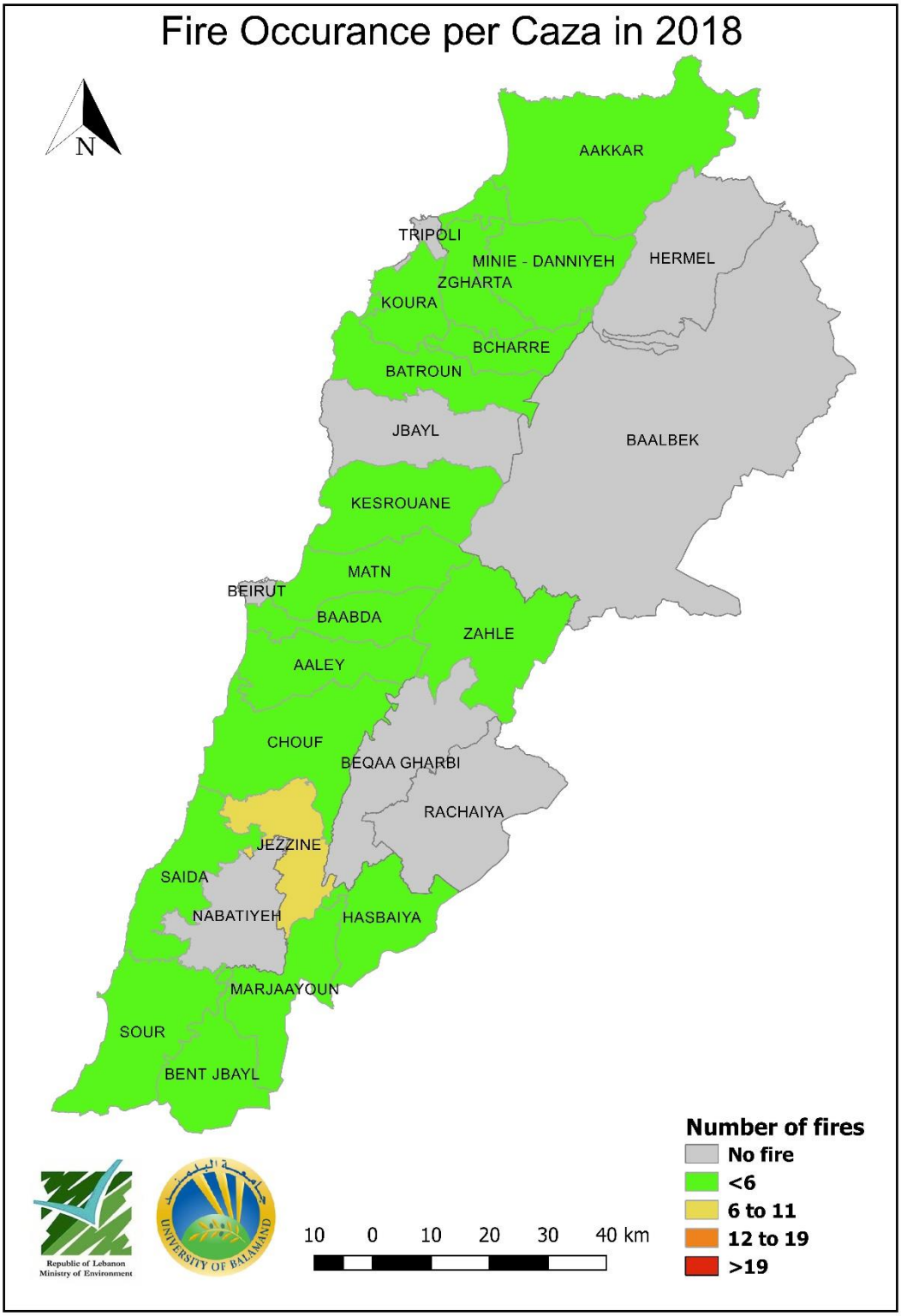
Source: IoB, 2018



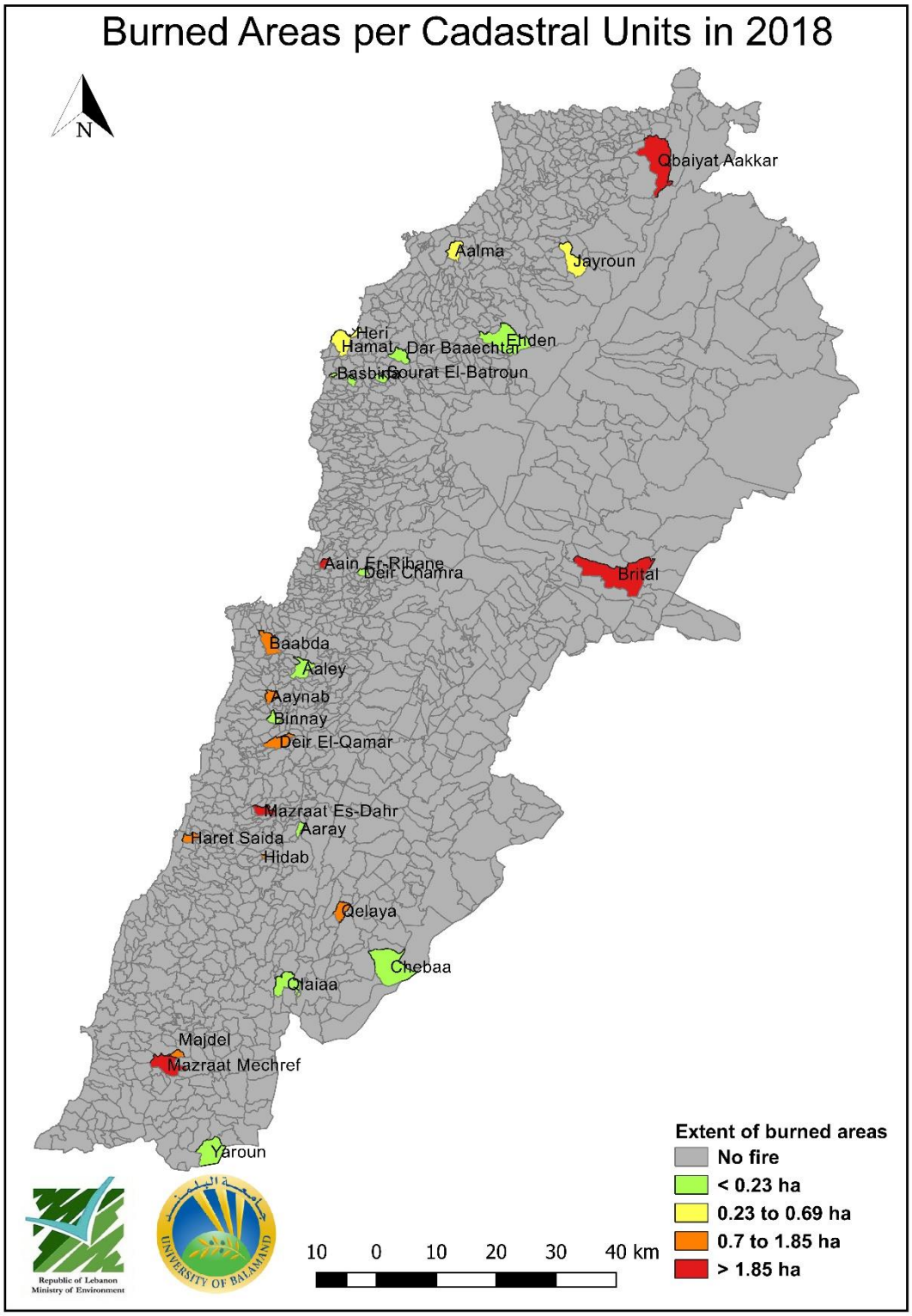
Source: IoB, 2018



Source: IoB, 2018



Source: IoB, 2018



Source: IoB, 2018

APPENDIX B – LIST OF CONSULTED STAKEHOLDERS

Name	Title	Organization	Contact Information
MINISTRIES			
Lara Samaha	Head of Department of Ecosystems CBD National Focal Point	Ministry of Environment	l.samaha@moe.gov.lb
Samar Malek	Acting Head of Environmental Technology Service	Ministry of Environment	samar@moe.gov.lb
Nadia el Ahmar, Jabbour	Acting Head of Planning and Programming Service	Ministry of Environment	nadia@moe.gov.lb
Jeff Gerges	Environmental Specialist	Ministry of Environment	j.gerges@moe.gov.lb
Zeina Hassane	Environmental Specialist	Ministry of Environment	Z.hassane@moe.gov.lb
Nizar Hani	Environmental Specialist	Ministry of Environment / Shouf Biosphere Reserve (SBR)	nizar@shoufcedar.org
Paul Moussa	Engineer	Ministry of Environment	p.moussa@moe.gov.lb
Sally Chalhoub	Project Assistant	"Sixth Biodiversity National Report" Project- MoE/ UNDP	-
Yara Daou Chalfoun	Project Research Assistant	"Climate Change Unit" / MoE - United Nations Development Programme (UNDP)	yara.daou@undp.org y.daou@moe.gov.lb
Chadi Mhanna	Director of Rural Development and Natural Resources	Ministry of Agriculture	c.mohanna@agriculture.gov.lb
Carla Jamous	Agricultural Engineer	Ministry of Agriculture	c.jamous@agriculture.gov.lb
Sylva Koteiche	Reforestation Department	Ministry of Agriculture	skoteiche@agriculture.gov.lb sylva.Koteiche@gmail.com
Zeina Tamim	Engineer	Ministry of Agriculture	ztamim@agriculture.gov.lb
Elene Ayoub	Forest Engineer	Ministry of Agriculture	eayoub@agriculture.gov.lb
Georges Freim	Engineer – Convention on International Trade in Endangered Species (CITES) focal point	Ministry of Agriculture	gfreim@agriculture.gov.lb
Ayman Ahmad	Judge	Ministry of Justice	ayman_ahmad@hotmail.com

Name	Title	Organization	Contact Information
Dona Challitah	Business Writer at eecoy.com/Former Correspondent at Trends Magazine/ Former Business Writer at Beirut Times Newspaper/ Researcher at Author/ Journalist	Ministry of Economy and Trade (MoET)	dchallita@economy.gov.lb
PUBLIC INSTITUTIONS			
Carla Khater	PhD in Landscape and Ecological Restoration/ Associate Researcher	Centre National de la Recherche Scientifique (CNRS)	ckhater@cnrs.edu.lb
Milad Fakhri	PhD in Marine Environment and Oceanography/ Associate Researcher/ Director of the National Center for Marine Sciences	Centre National de la Recherche Scientifique (CNRS) / National Center for Marine Sciences	milosman@cnrs.edu.lb
Kamal Slim	Ecosystemes aquatiques	Centre National de la Recherche Scientifique (CNRS)	kslim@cnrs.edu.lb; kamal.slim@hotmail.com
Céline Mahfouz	Researcher/ Marine Pollution/ Associate Professor	Centre National de la Recherche Scientifique (CNRS)	kalim@cnrs.edu.lb kamal.slim@hotmail.com
Ali Badreddine	Marine biologist, PhD en Oceanologie- Specialty: Coastal ecosystems conservation – Marine species (Benthos/ Exotic)	Centre National de la Recherche Scientifique (CNRS)	Celine.mahfouz@gmail.com
Aref Dia	PhD in Zooecology- Hydrobiology/ Professor of Ecology- Faculty of Sciences/ Researcher at the Research Lebanese Scientific center	Centre National de la Recherche Scientifique (CNRS) and Lebanese University	arefdia@yahoo.com arefdia@ul.edu.lb
Ali Chehade	Engineer - National Focal Point ITPGRFA	Lebanese Agricultural Research Institute (LARI)	alichehade@hotmail.com
Joelle Breidy	Seed Bank Manager	Lebanese Agricultural Research Institute (LARI)	jbreidy@lari.gov.lb
Bilal Jouni	Head of Environmental Department	Litani River Authority (LRA)	bilojouni@gmail.com
Assem Abou Ibrahim	Board Member/Head of Quality, Health, Safety and Environment Unit	Lebanese Petroleum Administration (LPA)	assem.abouibrahim@lpa.gov.lb
Nancy Awad	Specialized in Environment and Land use management	Council for Development and Reconstruction (CDR)	nawad@cdr.gov.lb
Jaoudat Abou Jaoude	Senior Planner	Council for Development and Reconstruction (CDR)	jaoudataj@gmail.com jawdata@cdr.gov.lb
UNIVERSITIES			
Jean Stephan	PhD in Plant Physiology/Associate Professor	Lebanese University - Faculty of Sciences	dr.jeanstephan@gmail.com

Name	Title	Organization	Contact Information
Hassane Makhlouf	PhD in Ethnobotany-Biogeography/ Coordinator professional Master/Professor	Lebanese University - Faculty of Sciences	drhassanemakhlouf@yahoo.fr
Souad Hraoui Bloquet	PhD in Systematics (Taxonomy), Ecology, Zoology/ Professor	Lebanese University - Faculty of Sciences / Biology	sdbloquet@yahoo.com
Lamis Chalak	PhD in Agrobiodiversity Plant Biotechnology, Professor, Head of Plant Production Department/ Head of National Committee for Plant Genetic Resources Established by the Ministry of Agriculture	Lebanese University – Faculty of Agriculture	lamis.chalak@gmail.com
Jihad Noun	PhD in Wild Useful Lebanese Plant Species/ Professor	Lebanese University – Faculty of Biology IV	jihadnoun@hotmail.com
Falah Assadi	Professor/ Plant genetic resources	Lebanese University / Wadi El Hujair Nature Reserve	falah.assadi@gmail.com wadi-alhojair@hotmail.com
Iffat Abou Fakher Hamad	Entomology	Lebanese University / American University of Beirut	Ima27@mail.aub.edu
Salma Samaha	Former Chair of Landscape and Territory Planning Department Affairs/Chair of Education and Academic Affairs at International Federation of Landscape Architects / Landscape Consultant / Associated Professor/ Researcher	Lebanese University	salmasamaha@gmail.com
Emilio Mouanness	PhD Department of Agri-Food sciences	Université Saint-Esprit Kaslik (USEK)	emilioimou@usek.edu.lb emilio_mouanness@hotmail.com
Nabil Nemer	PhD in Forest Entomology/ Associate Professor/ Associate Dean of the Faculty of Agricultural and Food Sciences	Université Saint-Esprit Kaslik (USEK) – Faculty of Agricultural and Food Sciences	nabilnemer@usek.edu.lb
Safaa Baydoun	PhD in Biochemistry/ Photobiology/ Director of the Research Center for Environment and Development	Beirut Arab University (BAU)	safaa.baydoun@bau.edu.lb
Marc Beyrouthy	Head of Department USEK (Agriculture)	Université Saint-Esprit Kaslik (USEK)	marcelbeyrouthy@usek.edu.lb
Magda Bou Dagher Kharrat	PhD in Biologie cellulaire et moléculaire des Plantes/Directeur du Département Sciences de la Vie et de la Terre Faculté des sciences	Université Saint Joseph (USJ) – Faculty of Sciences	boudagher@fs.usj.edu.lb

Name	Title	Organization	Contact Information
Rhéa Kahale	Project Coordinator	Université Saint Joseph (USJ)	rheakahale@fs.usj.edu.lb rhea.kahale@net.usj.edu.lb
Manal Nader	PhD in Biology and Aquaculture/ Director of Institute of the Environment /Associate Professor	University of Balamand (UoB)	manal.nader@balamand.edu.lb
George Mitri	PhD in Methods in Environment Bio-monitoring/ Director of Biodiversity Programme at the institute of the Environment/ Assistant Professor	University of Balamand (UoB)	george.mitri@balamand.edu.lb
Shadi Indari	Instructor	University of Balamand (UoB)	shadi.elindari@balamand.edu.lb
Moustapha Itani	Research Assistant	American University of Beirut (AUB)	moustapha.itani@gmail.com
Mohammad Al-Zein	Instructor	American University of Beirut (AUB)	ma73@aub.edu.lb
Gretta Abou Sleyman	Professor, Faculty of Health Sciences, Chairperson	American University of Science & Technology (AUST)	gretta.abousleyman@gmail.com
Anthony Ouba	Assistant Professor	American University of Science & Technology (AUST)	anthony_ouba@hotmail.com
Lauri Açaf	PhD Holder, Assistant Professor	American University of Science & Technology (AUST)	Laury.acaf@hotail.com
Nisrine Machaka Houri	Instructor/ Ecological Expert/ Freelance Consultant/ Environmental Expert	Modern University for Business and the Sciences (MUBS)	nmachaka@gmail.com
Nisreen Alwan	Dean of School of Health Sciences / Fresh water ecology	Modern University for Business and the Sciences (MUBS)	nalwan@mubs.edu.lb
Tanos Hage	PhD in Horticulture/ plant biochemistry and molecular biology/ Faculty member/Department of Sciences	Notre Dame University (NDU)	thage@ndu.edu.lb
NATURE RESERVES			
Ghassan Ramadan Jaradi	President of Palm Island Nature Reserve Committee (PINR)/ Ornithologist-Executive Director of the Rare Birds Committee in Lebanon	Palm Islands Nature Reserve (PINR) / CNRS	grjaradi@hotmail.com grjaradi@cnrs.edu.lb
Lina Sarkis	Project Manager	Shouf Biosphere Reserve (SBR)	lina@shoufcedar.org
Challitah Tanios	Site Manager	Tannourine Cedar Forest Reserve	Challitah.tanios@gmail.com

Name	Title	Organization	Contact Information
Raymond Khoury	Agricultural Engineer	Bentael Nature Reserve/ Green Plan	Bios.logoss@gmail.com
Sandra Koussa Saba	Reserve Manager	Horsh Ehden Nature Reserve	info@horshehden.org sandrasaba@hotmail.com
Joelle Barakat	Biodiversity Officer / Conservation Manager	APJM (Jabal Moussa)	Joelle.barakat@jabalmoussa.org
NGOs			
Maya Nehme	LRI Project Director	Lebanon Reforestation Initiative (LRI)	maya.nehme@gmail.com
Juliette Amidi	Research and Project Development Coordinator	Association for Forest, Development and Conservation (AFDC)	juliette@afdc.org.lb
Sawsan Bou Fakhreddine	Director general	Association for Forest, Development and Conservation (AFDC)	sawsan@afdc.org.lb
Bassima Khatib	Assistant Director General	Society for the Protection of Nature in Lebanon (SPNL)	bkhatib@spnl.org
Jina Talj	Founder	Diaries of the Ocean	jina@diariesoftheocean.org
Jasmine Kareh	Researcher	Diaries of the Ocean	jasmine@diariesoftheocean.org
Tamara Haddad	Researcher	Diaries of the Ocean	tamara@diariesoftheocean.org
Malek Ghandour	President	Lebanese Environment Forum (LEF) / Amwaj	amwajemvt@yahoo.com
Rebecca Baissari	Environmental Engineer	Lebanese Environment Forum (LEF)	rbaissari@lbeforum.org
Nour Jouni	Environmental Engineer	Amwaj	noor.jouny@hotmail.com
Youssef Matta	President of Hourouf NGO	Horouf NGO	youmatta@gmail.com
Mirna Semaan	Head of Friends of Nature	CAN	myrsem@hotmail.com
UN AGENCIES			
Joelle Salamé	Programme Assistant	UNDP	joelle.salame@undp.org
Fady Asmar	SALMA Project Manager / Biodiversity Expert	Food and Agriculture Organization (FAO)	fady.asmar@fao.com fadyasmar@gmail.com
INTERNATIONAL ORGANIZATIONS			
Mariana Yazbek	Scientist	International Center for Agricultural Research in Dry Areas (ICARDA)	m.yazbek@cgiar.org

Name	Title	Organization	Contact Information
Ziad Samaha	Marine Project Manager	International Union for Conservation of Nature – Regional Office for West Asia (IUCN-ROWA)	ziad.samaha@iucn.org
Wider Stakeholders			
Houssam Chaiban	Agriculture Engineer	-	-
Taghreed Diab	Environmental Education Expert	-	-
Myriam Jabre	Managing Partner	Coastal Forum	-
Johnny Fenianos	-	ASE	aselebanon@gmail.com
Private Sector			
Ricardo Khoury	Environmental Engineer	Earth Link & Advanced Resources Development (ELARD)	rkhoury@elard-group.com
Rana Ghoussainy	Environmental Consultant	Earth Link & Advanced Resources Development (ELARD)	rghoussainy@elard-group.com
Students			
Remond Launiot Prevost	Student	Université Saint Joseph (USJ) - École supérieure d'ingénieurs de Beyrouth (ESIB)	nlauniotprevost@gmail.com
Jessica Bou Shroush	Student – Biodiversity	Lebanese University	jessica.h.bsh@gmail.com

APPENDIX C – PROJECT'S STEERING COMMITTEE

Name	Title	Organization	Contact Information
Lara Samaha	Head of Department of Ecosystems CBD National Focal Point	Ministry of Environment - MoE	l.samaha@moe.gov.lb
Jihan Seoud	Energy and Environment Programme Manager	UNDP	jihan.seoud@undp.org
Nazmiah Baydoun	Head of Department of Waste Water Discharge	MoEW	nazbay@hotmail.com
Zahra Ramadan	Architect -Project Supervisor	Ministry of Public Work - Directorate General of Urban Planning (DGUP)	zahraramadan@hotmail.com
Tania Zaven	Archeologist	Ministry of Culture - Directorate General of Antiquities	tania.zaven@dga.culture.gov.lb
Sonia Najem	Coordinator of the Health and Environmental Education - Head of Environment and Education Unit	Ministry of Education	snajem@mehe.gov.lb; najemsonia@yahoo.com
Mona Siblini	Head of Horticulture-Field Crops Service	Ministry of Agriculture - MoA	msiblini@agriculture.gov.lb
Petra Obeid	Head of Youth and Local communities Department	Ministry of Tourism	petra.o@destinationlebanon.gov.lb
Majid Hachem	General Directorate of Local Administrations and Councils	Ministry of Interior and Municipalities	majid.hachem@hotmail.com
Mimo Ishac	Agronomic Engineer-Inspector	Ministry of Industry	mimoishak@hotmail.com; mimosami2014@gmail.com
Dr. Carla Khater	PhD in landscape and ecological restoration/ Associate researcher	CNRS	ckhater@cnrs.edu.lb
Dr. Milad Fakhri	PhD in Marine Environment and Oceanography/ Associate Researcher	CNRS	milosman@cnrs.edu.lb
Ali Chehade	NFP ITPGRFA	LARI	alichehade@hotmail.com
Bilal Jouni	Head of Environmental Department	Litani River Authority – Environment Department	bilojouni@gmail.com
Assem Abou Ibrahim	Board Member/Head of Quality, Health, Safety and Environment Unit	Petroleum Administration Lebanon	assem.abouibrahim@lpa.gov.lb
Dr. Jean Stephan	PhD in Plant Physiology/Associate Professor	Lebanese University - Faculty of Agriculture	dr.jeanstephan@gmail.com
Dr. Hassan Makhlouf	PhD in Ethnobotany-Biogeography/ Coordinator professional Master/Professor	Lebanese University Faculty of Science	drhassanemakhlouf@yahoo.fr

Name	Title	Organization	Contact Information
Dr. Magda Bou Dagher Kharrat	PhD in Biologie cellulaire et moléculaire des Plantes/Directeur du Département Sciences de la Vie et de la Terre Faculté des sciences	USJ – Faculty of Sciences	boudagher@fs.usj.edu.lb
Dr. Nabil Nemer	PhD in Forest Entomology/ Associate Professor/Academic Secretary of the Faculty of Agricultural and Food Sciences	Holy Spirit University of Kaslik	nabilnemer@usek.edu.lb
Dr. Emilio Mouannes	PhD Department of Agri-Food sciences	Holy Spirit University of Kaslik	emiliomouannes@usek.edu.lb
Dr. Manal Nader	PhD in Biology and Aquaculture/ Director of Institute of the Environment /Associate Professor	University of Balamand	manal.nader@balamand.edu.lb
Dr. George Mitri	PhD in Methods in Environment Bio-monitoring/ Director of Biodiversity Programme at the institute of the Environment/ Assistant Professor	University of Balamand	George.mitri@balamand.edu.lb

Ministry of Environment - Lebanon
Martyrs Square, Lazarieh Center, 7th and 8th floor, Block 2A - 2B
P.O.Box 11-2727, Beirut, Lebanon
T: +961 976 555 or 1789 F: +961 976 535
Website: www.moe.gov.lb
Facebook: www.facebook.com/Ministryofenvironment
National Biodiversity Clearing-House
http://www.biodiv.be/liban

United Nations Development Programme [UNDP]
Arab African International Bank Bldg, Banks Street
Nejmeh, Beirut 2011 5211, Lebanon
E-mail: registry@undp.org.lb
Website: lb.undp.org
Facebook: https://www.facebook.com/UNDPLebanon
Twitter: twitter.com/undp_lebanon
Instagram: http://instagram.com/undp_lebanon